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Alternate Generation and Parthenogenesis in the Animal Kingdom.

A LECTURE DELIVERED BEFORE THE VIENNA SOCIETY FOR THE DIFFUSION OF SCIENTIFIC KNOWLEDGE, BY DR. G. A KORNHUBER.

Among the various questions whose scientific explanation is the province of animal physiology, none has perhaps excited the interest of the people, as well as of scholars, to a higher degree than the propagation of organisms.

While in former times naturalists entertained the most various opinions and hypotheses, or indulged in the most chimerical speculations, modern science, armed with more perfect knowledge and greatly improved instruments, and more familiar with methods of exact research, has gradually succeeded in shedding some light on these mysterious processes.

These processes in general consist in this, that certain bodily constituents are from time to time separated from individual beings, and are developed into others of the same species. If the action of a second animal substance is necessary on such separated germs, which then show the characteristic structure of eggs, and are called ova, the process is called sexual propagation or generation; but if the germ under favorable external circumstances may become a new being without such action, this more simple though less general process is called unsexual or agamic reproduction.

To the latter belongs a series of phenomena to which I have the honor of directing your attention this evening; phenomena which have been accurately studied and verified only within the last two decades. A law has been established of the highest importance, not only to zoölogy but to all natural science, which has been named that of "*Alternate Generation and Parthenogenesis.*"

It was the brilliant Danish naturalist Steenstrup who, in the celebrated essay on "Alternate Generation," (Copenhagen, 1842,) first showed the way that would lead to a satisfactory explanation of the complicated phenomena attending the multiplication of the lower forms of animal life.

By alternate generation, Steenstrup understood the power of an animal of producing progeny differing from the mother, but itself capable of producing young, which again return to the form and character of the first parent; so that the daughter would not resemble the mother, but the grandmother. Sometimes this return to the original form occurs only in the third, fourth, or yet further removed generations. The peculiarity of this phenomenon not only consists in the alternation of different progeny, but also in that of sexual and sexless reproduction. One generation may consist of sexually developed males and females, and beget young from eggs, and the next may be sexless, and may bring forth young by fission, by buds or germs. These animals capable of agamic propagation were called *nurses* by Steenstrup, because it is their function to provide for the alimentation and development of the sexual animals. The number of sexless intermediate generations, as well as their degree of development and organization, differs in different species. They either possess provisory or temporary organs, and are therefore larvæ, or they are fully developed individuals, and already show the construction and mode of life of the sexual animals. The sexless larvæ of animals, such as butterflies, which undergo simple metamorphosis, are distinguished from our nurses by their inability to multiply by agamic reproduction; so that we may, according to Leuckart, consider alternate generation with nurses as a metamorphosis combined with agamic reproduction.

Alternate generation, very aptly called *metagenesis* by R. Owen, was first observed in the salpæ, a kind of mollusks which are as remarkable for their form as for their mode of life. They belong to the tunicata, and are found in great numbers in the ocean, the Mediterranean, and in all southern seas. They swim about a little below the surface, and present the appearance of oval or cylindrical bodies, clear as crystal, moving about either isolated or united in long chains, by taking in water and expelling it again.

Our German lyric poet, Chamisso, remarked, in his voyage around the world, that the isolated salpæ could not be members of a severed chain, because they did not resemble the individuals of the latter. He furthermore recognized that the solitary salpæ always contained a progeny resembling the chain, while the individuals of the latter contained a fœtus formed exactly like the solitary salpæ. Chamisso published his interesting observations in 1819, at Berlin, in an essay entitled *De animalibus quibusdam e classe vermium linnæana, Fasc.*

I. de Salpa, in which he expressed the view that the solitary salpæ proceeded from the individuals of the chain and the latter from the solitary ones. Chamisso's discovery was but little appreciated at first; it was even ridiculed as the vagary of a poet, until it was brilliantly defended by Steenstrup in 1842, and confirmed and expanded later by the accurate investigations of other zoölogists. We know now that the loosely connected chain is composed of hermaphrodite sexual animals, generating an embryo usually from one egg only, which remains connected for a time with the mother by means of a kind of placenta, and is nourished by it until, having attained a considerable size, it escapes and forms the solitary or isolated salpa—the only case of viviparity among the tunicata. The solitary salpa then generates a chain of sexually developed individuals by gemmation from buds, which take the place of male and female organs of generation, and thus represent their nurse.

On the coasts of the North and Baltic Seas immense swarms of clear, watery, bell-shaped creatures may be perceived in summer, swimming slowly around below the calm surface of the water, with their convex surface upward and their concave downward. These are the *Aurelia aurita*, *L.*, a species of acraspedote, or unfringed medusa, some of which are male and some female, as is the case in all medusæ. The sexual organs are ruffle-like folds on the inner skin of four bags or folds in the gastrical cavity, which open outward at the bottom of the stalk. By simple ciliary motion the seed of the male passes into the bags of the female and fecundates the eggs. These then pass out into the folds of the tentacles, where they are developed to embryos, which are provided with a very tender covering of cilia, and move about freely in the water like infusoria. This phase of evolution was formerly considered as a separate species, called *planula*. Soon, however, the cilia falls off, and the animalcule, thus deprived of its locomotive organs, sinks to the bottom, attaches itself to firm objects, and grows longer. In the free end a cavity soon appears, which gradually increases and is developed into a mouth, from which wart-like excrescences or papillæ shoot out and are afterward converted into tentacles. The animal has now the appearance of a polypus; and it was, indeed, formerly so considered, and called *hydra tuba*. After some time—perhaps months—a circular depression is seen just below the crown of tentacles, followed by others behind it. These depressions become deeper and deeper, and short projections appear in their edges, which afterward also develop into tentacles. The whole now bears a distant resemblance to the so-called *strobila*, or fir-cone, or to a set of flat cups resting on a columnar foot, the polypus. The separate divisions of the strobila are the origin of the future medusæ. They develop more and more, one after another, separate from their pedestal, and afterwards attain their permanent form, size, and maturity. They now turn the convex surface by which they were attached, upward, while the mouth, which was before turned up, now points downward. In the aurelia there is, therefore, an intermediate or nurse generation during the polypus stage, in which the animal is multiplied in an agamic way by gemmation and fission. Each of the individuals so produced is again developed into a sexual medusa.

In medusæ of lower organization belonging to the hydroids, which Gegenbauer has called craspedote, because their disk is provided with a velum, a similar kind of alternate generation takes place, with the exception, however, that the polypoid nurse reaches a much more advanced stage of independent development after leaving the ovum. It grows to a stalk of considerable size, and puts forth numerous polypus-buds. It is only when the colony has attained a high degree of development that the sexual animals are formed, which separate from the stalk, swim about independently, and deposit their eggs in remote spots.

In other hydroids the nurse acquires a still greater importance. In them, as in our sweet-water polypi, the sexual progeny appears only in the shape of globular appendages, which are not capable of being evolved into independent animals, but remain attached to the polypus-stalk, and resemble organs for the production of the sexual secretions.

We may with Gegenbauer call this latter form of alternate generation *imperfect metagenesis*. We see another remarkable instance of it in the peculiar many-shaped colonies known as *Siphonophoræ*, which swim about freely in the sea, and of which the *vraya dipheys*, *Blaine*, occurring in the Atlantic and the Mediterranean, may serve as an example. From the transparent ovum of this animal a ciliated larva is hatched. The plastic material contained in the body of this larva or nurse is then differentiated into a locomotory piece, (the posterior of the two swimming-bells at the beginning of the stalk of a ripe colony,) and an appendage which afterward becomes the second bell and the common stalk of the whole colony. The individuals now budaforth from this stalk in a fixed order, but do not separate. They remain so connected that their abdominal cavities all open into the canal passing through the common stalk. These individuals are not by any means formed alike, nor do they serve the same physiological purpose. The principle of the division of labor, which is carried out in the solitary animals so that their organs become constantly more numerous and more perfect, is here applied in such a manner that the various functions of animal life, motion, alimentation, defense, and aggression, as well as sexual reproduction, which is otherwise confined to single individuals, are here distributed among all the animals of the whole colony. In every tuft along the stalk, which sometimes numbers as many as fifty of them, we distinguish *nourishers* in the form of trumpet-shaped appendages with orifices called suction-tubes; *aggressors*, in the form of long contractile filaments or tentacles furnished with microscopic weapons (nettle-cells) at their knobs; *defenders*, in the form of stiff scales or helmets attached to the nourishers for purposes of defense; *reproducers*, developed after all the rest, in the form of racemous diœcious capsules swinging in small (special) swimming-bells. By the alternate contraction and expansion of the bell-shaped *swimmers* at the upper end of the colony, (the base,) with which the smaller special swimming-bells move in time, the whole colony is propelled through the water.

In a few other species, the *physalidæ* and *vellelidæ*, the sexual animals separate from their nursing-stalk and have a short, independent existence like the medusa.

The alternate generation of some of the intestinal worms is attended by the most wonderful and extraordinary circumstances. The most curious opinions have prevailed until very lately about their origin and reproduction.

On account of their various wanderings through different animal bodies, the *trematodes*, and more especially certain species of the genus *distoma*, so called on account of two suckers or stomata on the flat part of their bodies, are of peculiar interest. From the egg of the distoma a ciliated embryo, resembling infusoria, is produced, which swims about in the water, attaches itself to certain sweet-water snails, (Linnæus, Planorbis, &c.,) and penetrates into their bodies. There it grows, loses its cilia, and develops a mouth and an alimentary tube. Its contents aggregate into cellular heaps, which gradually assume a definite shape, and are converted into small animals. These essentially possess the structure of mature trematodes, but are sexless and have a tail-like appendage; they increase slowly in size and expand the worm which contains them, and which seems to have no other function than to protect them and promote their development, *i. e.*, to act as their nurse. When completely developed they pierce the envelope of their nurse and move about freely in the body of the snail until they pass through this also, and glide through the water with a winding motion by means of their tail. In this form they had long been known to naturalists under the name of *cercaria, Nitz;* but their relation to the trematodes was unknown until quite recently. The cercaria afterward seeks a new host among the many inhabitants of the water, (fish, mollusks, crabs, insect-larvæ, etc.,) penetrates them by means of its proboscis, and there loses both its tail and the sting of its proboscis, as no longer necessary to its new mode of living. It is now converted into a distoma.

If the animal finds all the conditions necessary to its perfect evolution in its new host, it continues to grow until it has attained maturity. If this is not the case, it remains small and sexless, surrounds itself with a transparent shell, which it secretes from the surface of its own body, and remains in a state of rest and inactivity like a pupa until its host is eaten up by a larger and stronger animal. Hence we find it in the intestines, the gall-bladder, the biliary ducts, the kidneys, etc., of higher animals, especially of ruminants, (in the liver of sheep, cattle, goats, and deer;) also in asses, hogs, hares, etc., and in rare cases in man. (*Distoma hepaticum, L.; Distoma hæmatobium, Bilharz.**)

Sometimes it happens that the progeny of the worm-like nurse does not immediately assume the form of the cercaria, but that of the mother. In that case an intermediate generation of larvæ is produced, which act as nurses of the cercaria, so that the worm resulting from the embryo might be called the grand-nurse.

Thus the numerous and fertile multiplication of germs by means of agamic reproduction counterbalances the difficulties and obstacles which these animals have to encounter in their various migrations through other organisms before they reach their perfect form.

Formerly the *tape-worm* was considered nothing more than a simple animal having a head and an articulated body. Since Steenstrup's time, however, and especially through the more recent investigations of v. Siebold and van Beneden, we know it to consist of a chain or colony of differently-formed individuals. The larger posterior joints (the so-called *proglottides*) represent the organs of generation, and contain many thousand eggs in their ramified ovaries. In these, microscopic embryos are developed, which are discharged when the ripe joints fall off with the excrement of the host. The embryos do not then leave the eggs at once, but remain in their envelopes, which are well fitted for resisting putrefaction or chemical agents, until the eggs are accidentally swallowed by some (usually an herbiverous) animal. In the intestines of the latter the embryo forces its way through the egg-envelope, softened by the digestive juices, pierces the intestinal walls and neighboring tissues, until it reaches a vein and is carried by the blood to more distant organs, in whose parenchyma it remains. After losing its embryonic hooks, the tape-worm larva grows to a bladder of varying size, along the walls of which numerous buds (the later "heads") arise in such a manner that the hollow body of the tape-worm head extends into the bladder. Such colonies were long known and considered as different species of animals. When one of them gets into the intestines of a larger animal, the head or bud provided with hooks and suckers is turned inside out, the bladder is digested, and the joints of the tape-worm (the real sexual, hermaphrodite individual) begin to grow behind the head. The reproduction of the tape-worm, therefore, passes through three different phases: The worm-like embryo or grand-nurse, the so-called tape-worm head or nurse, and the mature sexual animal.

With the exception of the salpæ, we have so far only considered cases of metagenesis where the nurses are in the form of larvæ. In the *arthropods*, among the *diptera*, we also find such nursing larvæ—an entirely new and remarkable phenomenon first discovered in the fall of 1861 by Nicholas Wagner, professor of zoölogy, in Kasan. It produced no small excitement among zoölogists, and was the cause of so much astonishment that v. Siebold himself designated it as hardly credible on receiving, after some delay, Wagner's essay in the "Zeitschrift für wissenschaftliche Zoölogie," 1863, vol. xiii, p. 513. Wagner could not then describe clearly the insect-larva which he had recognized as capable of reproduction, and v. Siebold took it from the illustrations to be a cecydomyde larva. Not long after, however, Dr. F. Meinert,* of Copenhagen, not only fully confirmed his beautiful discovery, but extended it by proving the different phases of development up to the imago, which Wagner† had meanwhile also accurately investigated. Meinert calls it the *miastor metraloas*, but according to the later researches of our excellent dipterologist, Dr.

* Zeitschrift fur wissenschaftliche Zoologie, 1853, vol. iv, pp. 53–76 and 454–456.

* Zeitschrift fur wissenschaftliche Zoologie, vol. xiv, p. 394.
† Vol. xv, p. 106.

Schiner, reported to the imperial zoölogical-botanical society in February, 1865, it hardly seems to differ from the genus *heteropeza Winnertz*. Reproduction takes place by means of germs. From seven to ten of these arise out of the accumulated plastic material in the body of the "mother-larva," and develop to "daughter-larvæ." The former is thereby gradually destroyed, and the progeny tears her skin and passes out. After three or five days the same process of germination begins in the new larva, and this continues from August to June, when all the larvæ of the last generation simultaneously pass into the pupa state. After three or four days the perfect insect, a small reddish-brown fly, emerges from the pupa. The correctness of these observations was afterward verified by v. Bær and v. Siebold, and Professor Alexander Pagenstecher, of Heidelberg, observed the same thing in another species and accurately described it.*

Metagenesis, with mature individuals as nurses, is exemplified among the arthropods by the aphides. As early as the middle of the last century, Charles Bonnet† had already communicated exact observations on the peculiar and remarkable mode of reproduction of the aphides, (plant-lice.) These well-known enemies of our gardens and green-houses cover the leaves, shoots, and branches of certain plants in thick swarms, and defy all our exertions to get rid of them by their extreme fecundity. During the summer months there is a series of nine or ten generations of fully-formed but sexless animals, or nurses, which bring forth living young without fecundation, and even without the presence of the male. Embryos are formed immediately from germs, which do not show the structure of true ova. They separate from peculiar tubes (germinal tubes) and develop in the body of the mother. In autumn the next to the last generation produces sexually developed males and females, which really cohabit. As in most insects, the male then perishes, while the female lays eggs, which hibernate and produce a new race of nurses the following spring. The anatomical examination of these animals, which was first undertaken by v. Siebold, and afterwards confirmed by Leidig, shows that the viviparous individuals are well developed, and resemble the oviparous females of the last fall generation, but that they are sexless nurses, because they lack the seed-bladder belonging to all female insects, and are, therefore, incapable of receiving the male seed.

All the phenomena of alternate generation were also called "*Parthenogenesis*" by the excellent English anatomist, Richard Owen, in 1849,‡ and this name, although somewhat inappropriate, was generally received on account of its euphony. When, however, the surprising discoveries of the last few decades put in question the theory that "every true egg cannot be developed into a new individual, (animal or plant,) unless it has been previously fructified by the action of the male seed," it seemed expedient to confine the term "parthenogenesis" to the new phenomena. In this sense it was first used by the ingenious founder of this important new theory, the distinguished zoölogist of the Munich University, Karl Theodor v. Siebold, in his paper on "True Parthenogenesis in Butterflies and Bees; an Essay on the Reproduction of Animals. Leipsic, 1856."

Parthenogenesis or virginal generation, according to Siebold, comprises "those phenomena which demonstrate that *true* ova may be developed into new individuals without the fecundating intervention of the male seed."

There is no want of observations of former times according to which the eggs of virgin insects were said to have produced new individuals, but they were considered erroneous. Zoölogists doubted that they were made with proper care, and attempted to explain them in different forced ways, finally classing them under metagenesis. Among them are the communications of De Geer on the psychides, and of Herold on the silk-worms. In 1845 the celebrated apiculturist, K. Dzierzon, a Catholic priest at Karlsmarkt, east of Brieg, in Prussian Silesia, emphatically maintained in the "Bienenzeitung," p. 113, that the eggs from which the male bees or drones originate are produced and developed by the sole inherent power of the mother bee without the action of male seed. This view at first seemed simply incredible to apiarists; they supposed that he had either deceived himself or intended to mystify others. But when Dzierzon reiterated his statement he was severely attacked, and the dispute continued for a long time.

Until 1852 Dzierzon stood alone against their attacks, but undaunted, unconquered. He could fall back on the experience of many years. Every one knows that there are queens which produce only male progeny or drones, and never lay an egg from which mature females, queens, or stinted females, workers are developed; that there are others which may lay female eggs for a time but afterward become like the former, and that finally there are worker-bees which lay eggs, which give birth only to male individuals.

Among the first class Dzierzon frequently found bees whose wings were lame. They were thus prevented from making their hymeneal flight from which they would otherwise have returned impregnated. Other queens, which laid male eggs from the beginning, were hatched either very early or very late in the year, at a time when there were either no more or only very few drones left, so that their flight was in vain. Queens which at first laid normal eggs and afterward produced only drones were older individuals, whose stock of seed had become gradually exhausted. Worker-bees, which sometimes lay eggs and never have any other than male progeny, have never been and are indeed incapable of being impregnated. From these facts Dzierzon concluded that impregnation was unnecessary to the production of drones. That in common normal generation, where the queen returns impregnated from her flight, the drones are developed from unfecundated eggs, *i. e.*, from those through whose micropyles the spermatozoa have not penetrated, is proved by Dzierzon from the following fact: After the introduction of the Italian

* Zeitschrift fur wissenschaftliche Zoologie, xiv, p. 400. Further investigation of this subject is communicated by Leuckart, in Troschel's Archiv., year XXXI, No. 3.

† Traite d'Insectologie, tome I: Paris, 1845.

‡ On Parthenogenesis; a discourse introductory to the Hunterian Lectures on generation and development for 1849. Delivered at the Royal College of Surgeons of England: London, 1849.

bee, (*apis ligurica,*) distinguished by the light color of its posterior abdomen, all the young drones from an Italian queen and a German father were true Italians, while the female progeny were clearly mixed.

The convincing truth of these facts and the logical, conclusions drawn from them at last brought such eminent bee-masters as Pastor Georg Kleine, of Lüethorst, in Hanover, and August v. Berlepsch of Seebach, near Gotha, into Dzierzon's camp; but they found no entrance as yet into zoölogical science, because these practical men were unable to furnish the proper scientific proof to physiologists, who either did not know or purposely ignored these phenomena.

The important discovery of the micropyle of the insect-egg, made almost simultaneously in 1854 by Meissner,* of Göttingen, and Leuckart,† of Giessen, raised the hope of the apiculturists, and seemed to make it probable that Dzierzon's views would be proved by scientific men. At the thirty-first meeting of German naturalists and physicians, held at Göttingen in 1854, Pastor Kleine succeeded in winning Professor Leuckart for his cause just as the latter had demonstrated his beautiful discoveries about the eggs of insects. Leuckart had never been able to obtain any bee-eggs, and was then for the first time, according to his own confession, initiated into the mysteries and problems of bee-life.

The first direct proof of the existence of real parthenogenesis was furnished by Leuckart in the "Bienenzeitung," 1855, p. 127, where he communicated the results of the microscopic examination of a queen-bee sent him by Baron Berlepsch. This queen had been hatched in September, 1854, a time when no drones existed. The next spring she had filled fifteen hundred cells with male progeny. On dissection it became evident that the queen had not been impregnated. She was a normally formed female with seed-pouch and eggs; but instead of spermatic filaments the former contained a perfectly clear liquid, devoid of granules or cells, just as in the pupæ of queens.

In order to establish Dzierzon's view fully it still remained to be proved that in impregnated queens laying normal eggs, the males are also develeped from unfecundated eggs. For this purpose Baron Berlepsch invited Professor Leuckart to Seebach, where he could institute microscopic investigations. Leuckart went there willingly, but he could not obtain a definite result, in spite of all his long continued exertions. K. Th. v. Siebold, who went to Seebach a few months later, by invitation of Baron Berlepsch, and resumed Leuckart's researches, was more successful. He worked in vain for three days and declared that nothing could be discovered by means of the microscope. He was to return next morning, and the carriage was already before the door when he appeared before the baron and asked permission to remain one day longer. He stated that he had been unable to sleep on account of his want of success, and that a new method had occurred to him, which he desired to try.‡ This method succeeded perfectly, and v. Siebold very frequently saw seed-filaments (thirty-one times in fifty-two, and in two of these cases mobile) in the interior of the bee-eggs. But these spermatozoa were found exclusively in female eggs, and were entirely wanting in the male.* We therefore owe to Siebold's wonderful observations and laborious experiments the definitive establishment of Dzierzon's theory that the drone-eggs are developed parthenogenetically without impregnation by the male seed. This fact, abundantly confirmed by many accurate and oft-repeated investigations, and also by Leuckart's valuable work,† must now be received as scientifically established.

When parthenogenetical reproduction was thus undoubtedly proved in bees, the above-mentioned more ancient statements were carefully re-examined. In the *Solenobia triquetrella* and the *Solenobia lichenella* belonging to the moth family, it was found that the females (which were brought up from the caterpillar stage in a closed box) laid numerous eggs soon after leaving the pupæ, and that these eggs produced small caterpillars. V. Siebold dissected such moths before and after they laid their eggs, and found their ovaries constituted exactly like those of other female butterflies, but not a trace of male spermatozoa could be discovered.‡ The eggs could not therefore be impregnated, and must undergo spontaneous development.

Of the remarkable apterous butterfly, *Psyche helix, Siebold,* whose caterpillar makes a spiral bag, no one has yet been able to find the male, although it has been sought for over fifteen years. And yet these females annually lay their eggs in the pupa envelope, which remains behind in the caterpillar bag, and in the fall these produce the caterpillars. On dissection, true eggs with micropyle, a seed-vessel, but always without male spermatozoa, and a copulating pouch are found. These peculiarities preclude the opinion that the psyche female is only a nurse.

V. Siebold and Schmid furthermore succeeded repeatedly in obtaining caterpillars from the eggs of a virgin silkworm, and from those of the *Smerinthus,* which became pupæ and emerged as perfect male and female insects.

A. Barthelemy§ also confirms the existence of parthenogenesis in *Bombyx mori,* and furnishes various proofs. He also observed the laying of unimpregnated eggs by other butterflies, which are hatched if they belong to the first generation of the year, but never survive the winter.

Jourdan‖ also observed true parthenogenesis in the silk-worm.

At the forty-seventh meeting of Swiss naturalists at Samaden, de Filippi reported that healthy caterpillars were hatched from the eggs of the Japanese silk-butterfly, although they had certainly not been fecundated, and mentioned a similar observation of Curtis on the *Bombyx atlas.*

In certain species of coccides Leuckart (p. 36) also found parthenogenetical generation. In the *Lecanium* and *Aspidiotus,* for instance, the eggs are developed in tubes without being previously

* Zeitschrift fur wissenschaftliche, Zoologie, vi, 272.
† Archiv. fur Anatomie u. Physiologie, 1855, p. 90.
‡ Bienenzeitung, 1863, p. 222.

* True Parthenogenesis, etc., p. 111.
† Zur Kenntniss des Generations wechselsund der Parthenogenese, etc., Frankfort, 1858, p. 51.
‡ Also Leuckart, *idem,* p. 45.
§ Etudes et considerations Generales sur la Parthenogenese, (Annales des Sciences Naturales, XII, p. 307.)
‖ Compt. Rend., 1861, tome 53, p. 1093.

impregnated, and the spermatozoa are entirely wanting. In the genus *Chermes* (*Ch. abietis, Kaltenb., Ch. laricis, Harling, Ch. piceæ, Ratzb., Phylloxera coccinea, Heyden*) of the plant-lice, having, according to Leuckart,* both a winter and a winged summer generation, which latter was erroneously taken for males by Ratzeburg, reproduction proceeds by means of eggs without previous impregnation. Leuckart examined two hundred animals, and never found males but always females, and they virgins. Males do not seem to exist, or if they do, parthenogenical reproduction seems to be the rule. Less accurate observations of the same kind were made by Dr. Ormerod† on the *Vespa britannica*, and by Stone‡ on the *Vespa vulgaris*.

Leuckart (pp. 105–107) has furthermore established the fact that in all other sociable *Hymenoptera*, as the bumble-bee, the wasp, and the ant, as well as in the bee, parthenogenesis prevails. Egg-laying workers, which are exceptional with bees, are the rule with these animals. Future researches must decide whether their progeny is always male, as Huber's§ observations of bumble-bees seem to indicate. No doubt we will also find parthenogenesis with many other insects, such as the termites and the gall-fly. In the gall-fly, a species of *cynips*, no male has yet been discovered, but only females.

The experiments of Lievin and Zeuker, which demonstrated the spontaneous development of the daphides, have been confirmed by J. Lubbock. Millions of the females of these animals, which are scarcely a line long, may be seen in summer moving about in cisterns and other standing sweet waters. They multiply in rapidly succeeding generations by means of unimpregnated or summer eggs in a cavity between the shell and the back of the animal, where they develop into individuals exactly resembling the mother, and multiplying parthenogenetically on separating from her. In the fall males are born, which cohabit with the females and produce one or two darkly-colored winter-eggs, which are surrounded by a second firm envelope called the ephippium, to protect them during their hibernation.

Although there can be no longer any doubt about the correctness of these facts, which have been established by the repeated, careful and accurate observations of our most distinguished zoölogists, and although the existence of parthenogenesis among a number of articulate animals is proved beyond dispute, attempts are not wanting to render them suspicious, and represent them as unreliable. Every truth differing from long cherished opinions is received slowly and with difficulty.

Tigri proposed, in a paper to the Paris Academy of Sciences,‖ to explain the parthenogenesis of the *Bombyx mori* by the supposition that there is a double cocoon containing two individuals, a male and a female, which might have copulated before leaving their shell. This supposition would presuppose the most extraordinary carelessness on the part of the above-mentioned observers. It amounts to charging them with not being able to distinguish a double from a single cocoon, or with neglecting to examine the organs of generation and determine the sex of the individuals. Errors of so crude a nature would hardly be committed by men but little acquainted with methods of research, much less by naturalists of high standing.

Schaum* states that he cannot receive the theory of the parthenogenesis of insects, and thinks he can explain it away by an hypothesis of Pringsheim. According to this the queen-bee, and the workers which lay eggs, might be androgynous, and possess male organs of generation besides their ovaries. In all cases where the skilful anatomists, v. Siebold and Leuckart, dissected such bees, there were no traces of testicles, so that the above supposition remains without foundation.

The existence of hermaphrodite bees, which were observed by v. Siebold in the apiaries of Mr. Engster, of Constanz, Bavaria,† cannot be brought forward as a proof against parthenogenesis, but rather seems to confirm it. It was observed that the pure worker-bees drove the hermaphrodites out of the hive the moment they left their eggs, and did not even suffer them to remain on the board outside. The hermaphrodites perished in a short time, and could never have reached the egg-laying stage, even if eggs had afterward formed in their originally empty ovaries. According to Pringsheim, every queen would have to be an hermaphrodite; but in the lance-winged and drone-producing queens, which were repeatedly examined by the above observers, no trace of androgynism or of spermatozoa could be found.

Dybocosky also appeared against parthenogenesis in his inaugural dissertation, "de parthenogenesi;" but his objections are unfounded, and evince neither thorough investigation nor satisfactory knowledge of the subject. The same is the case with various other objections brought forward by the opponents of parthenogenesis. None of them will stand test.

The reliability of the theory is established beyond doubt by many well-proved facts, and we may rejoice that we have thus gained a new and highly important law for the explanation of the most wonderful phenomena in the animal kingdom.

Novice.

MR. EDITOR:—We are glad to see the familiar face of our old BEE JOURNAL once more, changed in no way, except to improve it.

Thanks for your kind notice of "*Gleanings*."

The article entitled "The December Journal," it seems to us, Mr. Burch should have headed "On Novice." Our article in the same number answers most of his charges, and those who care to examine our writings here for the past year, beside those of Mr. B., in the *Bee Keepers' Journal*, can see whether there is not more repetition of our *ideas* (not language) than could be accidental. What few ideas we originate we prefer should be credited to "Novice," or the AMERICAN BEE JOURNAL, at least.

*Troschel's Archives, vol. 25, p. 208. *Schizoneura* seems to have only an oviparous fall generation.

†Zoologist, 1859; and Entomol. Annual for 1860, p. 87.

‡Proceedings Entomological Society, 1859, p. 86. Smith in Entomol. Annual for 1861, p. 39.

§Transactions of Linn. Society, 1802, vol. 6, p. 288.

‖Compt. Rend., lv, 1862, p. 106.

*Berliner Entom. Zeitschrift, viii, p. 93.

†C. Th. v. Siebold on Androgynous Bees, Zeitschrift fur wissenschaftliche Zoologie, vol. xiv, No. 1, and in the Eichstadter Bienenzeitung, year xix, p. 223.

Mr. B's strong assertions are certainly very thoughtless on many points; the one in particular where he claims to have given a description of the simple hive we have advised, "to the world *a year before we gave it*," was certainly unwise. If he will mention where he gave such description, perhaps some one who has seen or understands the peculiarities of the hive we recommend will show him his mistake.

As to our puffing Mr. Langstroth's hive, we shall be surprised indeed if any one, from Mr. King down, at the present time, ever thinks of paying him anything, even a well-deserved compliment. We have never bought, nor sold, nor in any way aided, that we know of, the sale of a single right for his hive; but we did for the American, long ago. Langstroth's invention of movable combs, it does really seem, should have entitled him to some compensation, for, to our knowledge, he labored long and earnestly bringing out the result he has given us. Most of you know the result; the extreme difficulty of preventing "Young America" from making something so simple, and something, too, that all could demonstrate with saw, hammer and nails, was too great a temptation, and the invention was adopted and approved of many times, without even a "thankee, Mr. Langstroth," for we are a busy people, and don't always stop to enquire, when a thing suits us. If Mr. L., or a proper representative, had come along, or should even now, at this late day, and presented the matter properly, we think "our people" would have done all that is fair, and will even now. It is true that Mr. L. advertised his patent and told the people how they could show their regard for his services, but we believe, as a general rule, *people are rather slow in writing letters with money in them, for something they have got already, and when there seems no probability of anyone disputing possession.*

Page 175. Mr. Gallup, we perfectly agree with you in regard to tall hives, and perhaps may also in regard to the "New Idea," when Adair takes the "patent" off from it. He (Adair) says a division board is a positive damage, and, besides, is somebody's "patent," (Oh, dear!) too.

Do you believe division boards are useless, too, Mr. G.?

Page 176. Mr. Davis' idea of earth filling for bee houses we think very favorably of, but should it not be dry dust, rather?

Many thanks, Mr. Davis, for the suggestion.

Page 178. Not the "Improvement Suggested," for we think it should be carefully "skipped," and so advise every candid and serious bee-keeper to avoid reading it; but we mean about "Wintering Bees." A number of practical experiments convinced us that "double walls" were of no advantage, but we may have been mistaken. Mr. Doolittle's plan of shovelling snow around hives out on their stands would be cheap and excellent where snow was plenty, but it is seldom the case here. "Double walls" have been proposed and tried for years, but we know of none who have continued to use them long. Wintering in-doors we think is conceded to be much the least trouble.

We agree with Mr. McGaw and Mr. Fortune that it does seem too bad that so much money and time has been spent in houses and traps for "artificial fertilization," and the result only so many total failures. It's really enough to make a body cross and "sassy," like "brother Furman."

By the way, we really think Mr. Furman was careless and did not mean to misstate in the matter of Grimm and Furman. If all of our bee friends could be as prompt and careful in their dealings as Mr. Grimm has been, so far as our experience goes, we should be much pleased indeed.

The plan of sending money and then having to wait weeks, or months, and sometimes years even, for queens or hives, or whatever it may be, is abominable. If the goods can't be sent, *say so*, or send the money back. That is the way in other lines of business.

We heartily agree with Miss Ella in regard to Averill chemical paint. We know of few things that we ever enjoyed more than painting "dollar" hives under the grape vines before breakfast. No skill is required, as the paint runs smooth like varnish, and dries so quickly that it does not inconvenience the bees, and makes a smooth, glossy coat. To be sure we got some of it on our shirt sleeves; we always do; but any "lady" would, of course, have sense enough not to do that, if we of the sterner sex haven't.

Our bees, at this date, Feb. 8th, are all right, even some colonies containing none but "old bees," as an experiment, and we think the idea that seems to be gaining ground, that old bees caused the dysentery, a mistake. We often winter queenless colonies without trouble, and so have others. We have lost two very weak nucleus colonies with less than a pint of bees, but they died because our room was cold, we presume, or at least too cold for those so weak in numbers, viz: about 35 degrees, some of the time. We must confess to not being partial to *very weak* colonies.

If Mr. W. E. Freeman, page 187, reads the back numbers carefully, we think he will be satisfied that box hives suffered full as much with the dysentery as those on which the extractor was used. The question has been many times proposed and as often dropped.

And now, friends, all, if you please, for this time, we will be NOVICE.

[For the American Bee Journal.]

Sundries.

Whilst the proceedings of the American Bee Keepers' Society furnish very pleasant reading as you go along, still at the end you are only conscious of a jumble of heterogeneous and often discordant matter, utterly bewildering to the novice. An experienced apiarian may know how to sift and sort it—will understand what weight to give to this man's evidence, or that lady's conjectures, but the poor novice can only ask with Pilate, "What is truth?" and turn wearily from what is virtually to him a Barmecide feast.

Now, Mr. Editor, it should be made the duty of some one (and who is better fitted than yourself?) to take this tangled skein and untie and sort it and spread it out for the pleasure and profit of the readers of the AMERICAN BEE JOURNAL. Surely our profession has made sufficient progress to be dignified with the title of a science, and as surely we

must make decided advances from year to year, but how much more satisfactory would it be if some competent hand would from time to time announce with no uncertain report the substantial results of each year's study and experience. For example, whilst there are many good ways of transferring bees, certainly there must be some *best* way, and so of introducing queens, feeding, wintering, &c., &c. There ought to be some one courageous enough to say which (weighing all the circumstances) is the best plan of hive, size of frames, boxes, &c., &c., but as this is very delicate ground to tread on, perhaps we must leave each bee-keeper to work out his own painful and expensive experience. In all other matters, however, I can see no objection to a fair and honest statement of the advance in the art apiarian. I would again make the suggestion that a monthly "Hint" might be given as to what should be done in the way of feeding, overhauling hives, &c. The difference in latitude of your various subscribers is not so great but that some time during a month your suggestions would apply. Further, I would reinforce the various admonitions of the February number, that we should strive to crush out that querulous tone which too frequently mars the communications to the JOURNAL. *Point* is a good thing, but the sting which is *left behind*, like that of our pets, is more injurious to the giver than the receiver, but bad for both. Let us turn over a new leaf in this regard, and determine that henceforth we will ask and give advice in all simplicity and kindness.

Finally, I wish you God speed in your good work. You have a noble exemplar in your predecessor. I believe that he was pure, honest, upright, outright, and downright. He had his deep convictions and was not afraid to give them utterance. He gave praise when he thought it was due—if he detected imposture, he "flashed it up as a policeman's lantern flashes up a rogue," but he was always honest, frequently "to his own hurt." I trust that his dream may be your reality, and that under your guidance the JOURNAL may find its way to every household that can appreciate rural pleasures, teaching them more and more to value and cherish

"The breath of their gardens,
The hum of their bees."

Gordonsville, Virginia. B. JOHNSON BARBOUR.

NOTE BY ED. A. B. J.—Our esteemed correspondent summons us in the foregoing letter to a well nigh impossible task—that of deciding, amidst conflicting theories and methods, which is absolutely best. We are not gifted with infallibility, and if we were to claim the possession of such a gift, a host of readers would "compass us about like bees," to dispute our exercise of it. We are quite free to admit that the diversities of opinion among bee-keepers on various points must be somewhat "bewildering to a novice," but the only way of relief we know of is that pointed out in Holy Writ, "Prove all things, hold fast that which is good." There is no royal road to bee-keeping. Every bee-keeper must test for himself the various methods proposed, and choose those he finds most satisfactory. Apiarians of equal eminence differ in their modes of transferring, introducing queens, feeding, wintering, &c., but one thing is quite certain, and that is, the "novice" will not go far astray if he copies any one of them. The same in effect, is true of hives. We cannot undertake to decide which of all the numerous hives is best, but bee-keeping can be carried on successfully with any movable-frame hive. They are all good. Doubtless there are good, better, best, but who is to put on the labels, indicating their comparative merits? The only plan is for each to follow his own preference.

In regard to monthly hints, the difficulty is precisely that which our correspondent supposes does not exist. "The difference in latitude of" our "various subscribers" is "so great," that what would suit one locality would be utterly inapplicable in another. We have subscribers in Minnesota and Canada to the north, and in California and Florida to the south;—in the one latitude bees are freezing to death, and in the other

"Gathering honey all the day,
From every opening flower,"

during the same month. Two sets of hints, northern and southern, might possibly be given, but even these would vary considerably in their application.

We thank our correspondent for his kind concluding words, and in return, wish him great pleasure and success in his apicultural undertakings.

[For the American Bee Journal.]

The late Richard Colvin.

I was surprised to see no notice of the death of Richard Colvin, of Baltimore, in either the January or February numbers of AMERICAN BEE JOURNAL, and could only account for it by supposing that Mr. Langstroth's health was too bad to permit his writing, and that Mr. Geo. S. Wagner had not been informed of the death of his father's old friend.

Although Mr. Colvin has, of late years, been very little known to the bee-keepers of the country, their obligations to him are very great. He was one of the first men of means who took hold of the movable comb system, and gave his time and money freely to introduce it into general use, less from any hope of pecuniary reward, than from a desire to aid the cause of bee-culture, in which he took so deep an interest; but I will say no more on this subject, as I am sure Mr. Langstroth, who is so much better able to do it justice, will treat it fully so soon as his health will permit. Mr, Colvin was among the first importers of the Italian bee. If I am not mistaken, he was the very first person who attempted to import them, but they died on the voyage, and some one else received a queen in good order before his second hive arrived.

There are several articles from Mr. Colvin's pen in the first volume of the AMERICAN BEE JOURNAL,

and a very valuable paper by him on bee culture, in one of the reports of the department of agriculture, which show his thorough familiarity with the subject, and make us regret that he was not a frequent correspondent of the JOURNAL. His pleasant manner and great kindness of heart endeared him to all who had the good fortune to know him, and his early death, for he was a man in the prime of life, leaves a vacancy in the list of apiarians which cannot easily be filled.

DANIEL M. WORTHINGTON.

St. Denis, Md., Feb. 12, 1873.

NOTE BY ED. A. B. J.—We feel obliged to Mr. Worthington for calling attention to the late Mr. Colvins' worth and usefulness. The circumstances of great affliction and sore bereavement in which Mr. Langstroth has recently been placed, and which are explained more fully elsewhere in this number, sufficiently account for the absence of any obituary notice from him.

[For the American Bee Journal.]

Dysentery Among Bees.

The primary cause of dysentery lies in the food upon which the bee subsists, while there are other tributary causes, such as atmospheric temperature, too long confinement in the hive, sudden transition from cold to hot while in confinement, etc.

When the food, honey or syrup, is free from an overcharge of acid, of a refined character, free from gross particles, and of proper consistency, bees are seldom affected with dysentery. During long drouths, bees gather a large proportion of acid with their honey, for the reason that the flow of the sacharine matter is so scant and slow that it partakes largely of the impurities and acid of the vegetable, and will produce mortality in a very short time, when the bees are confined to the hive. Very thin honey is also unfit for winter food. The fluid and alimentary proportions being unequal, the fluid cannot be thrown off sufficiently fast through the pores and in respiration, but accumulates and distends the bowels, and when long confinement in the hive ensues, dysentery follows.

The instinct of the bee never errs in the preparation of its food, when all things are equal, bees in numbers, and the internal temperature of the hive proper. The alimentary and fluid proportions of honey are always equal, and when free from acid produced by long drouths, gathered when seasonable, and the flow of honey is free and easy, bees will live upon it in confinement (the repository being kept at a proper temperature) for six months.

Although bees get no older with the lapse of time while hibernating, still bees that have lived out one-half or two-thirds of their lifetime before going into winter quarters are more easily affected than young bees.

Mr. Quinby suggests that the primary cause of the great loss of bees in the middle and northern states, during the winter and spring of 1872, was attributable to the cold north-west winds that blew for months without cessation. But we are strongly inclined to the opinion that the primary cause was in the food, and the long continued cold only a secondary cause. During the winter of 1855–6 bees were not permitted to fly out of their hives for near three months, in Illinois; the ground was covered with a deep snow, and the mercury ranging from zero to 26° below during the night hours, and the cold north-west winds almost constantly sweeping over our vast prairies, yet it did not affect the bees with dysentery, and, so far as I know at this time, they all wintered on their summer stands, repositories being little used at that time.

Mr. Q. calls our attention to Giles B. Avery's repository of bees in Albany county, which had safely wintered for years, but all died during the winter of 1872, except fourteen swarms, and the mercury stood quite evenly at 36°. Now when we contrast the temperature of Mr. Avery's repository with the temperature of the winter of 1855–6 in Illinois, we feel more than ever confident that the food is the basis of the health of the bee. My bees were also affected with dysentery during the winter of 1872, and twenty-five swarms were entirely lost. In the month of May, when I commenced multiplying swarms, I made a number of swarms by brushing the bees from the frames and giving them cards of honey from the hives left by the bees that died with the dysentery, and closed them up in a dark room, from two to three days, and when liberated they were badly affected with the dysentery, leaving their excrement at the mouth of the hive. The old bees were most affected and *vice versa*. I substituted a different quality of honey, but not better in appearance, and other swarms came out of the dark room all right.

Dr. Jewell Davis asks the question in the *North American Bee Journal*, why it is all colonies are not alike affected that forage upon the same pasturage during a heavy drouth, if that affects the honey with acid and destroys the bee? I suppose the Doctor only wanted this question answered supposing it would accommodate some new beginner. I might ask the Doctor why all swarms do not fare alike in the same warm repository, when the difference in them when the deposit was made was imperceptible. The simple fact lies here: the internal condition of the hives or swarms at the time the acid honey gathering commences. The one surviving was well stored with good honey at the time, but the other had its combs empty, or so nearly so, that it had room enough to store away acid honey, evaporated cider, and grape juice, to make its once happy home a melancholy abode, where affliction and death reign.

Mr. Alley, of Wenham, Mass., more than suggests, if my memory serves me right, that the cause of the great mortality among the bees was produced by the honey-dew gathered in the fall season. But, honey-dew being the saccharine part of the fluid or sap of vegetation, and, when abundant, exhales through the countless pores of the leaf, condensing in drops as it comes in contact with the atmosphere, I suppose no one ever saw honey-dew in the fall of the year in our latitude, not even aphis honey-dew, it being nothing more or less than an extra amount of honey from the tendrils and leaves of vegetation taken into the stomach, that cannot be absorbed by the insect, and is thrown off in excrement, changed little from honey.

Camargo, Ill., Nov. 15, 1872. A. SALISBURY.

[For the American Bee Journal.]

The November Journal.

MR. EDITOR:—The November JOURNAL came to hand unusually early—October 30, while its usual time is between the 10th and 14th of each month. Like its predecessors, it is fraught with most valuable information on bee culture.

Carl Gatter gives us a valuable treatise on honey as a medicine. I, being somewhat of a philosophical or lay doctor, fully endorse his views.

Next comes the Michigan State Bee-Keepers' Association. If other associations would give full and valuable reports like this one, we, the "Bee School" boys, would open our throats wide to swallow them. The mortality of bees last winter seemed to be the burden of their discussion. My own experience convinces me that Quinby is right, as to long protracted cold being the cause of the disease. I have so little, if any, of the disease—dysentery, as it is called—among my bees, as to be ignorant of it, except through the bee journals. The winters here are so mild that my bees are scarcely ever confined over three weeks at a time in midwinter, without a few warm days at intervals, in which they can fly out. Last winter I believe they were confined at least nine weeks without a warm day to fly out, and yet came out all right in the spring, though very few in number, owing to the fact that the queens ceased laying very early in the fall, and consequently there were very few young bees when the winter set in. They came out in the spring better than I could have expected in such a case. One stand, that had filled three large caps, 24 lbs. each, without bottoms, and from which I had not extracted any, went up. The bees in this stand were very full in November, and appeared so about the first of January, but I had not opened them until about February 20, and, to my surprise, there was the queen with only a tea-cupful of bees. Every comb was filled, from top to bottom, with honey, except the three middle ones, and they were also three-fourths full, showing that the queen had been crowded out of her brood-nest until winter set in, and consequently they were nearly all old bees, and wintering between two walls of ice could do no better than they did. I trust that even a novice can see this case was not dysentery. It was my own fault in not extracting half their honey in the summer or fall. This was the only stand I neglected, and it illustrates how the old fogies keep bees, leaving every stand to take care of itself, as I did. I would here state I saved all the honey from the stand referred to, and the queen, by giving her to a queenless colony, and she proved one of the most prolific queens I had during the past season. Some would have said that from her being in a hive full of honey and so few bees to keep her warm, she was of course of no further account, her prolificness was played out. But the contrary proved the case.

Friend Gallup, as might be expected from his great knowledge of the wants and habits of the bee, is always in the front ranks of improvements. True, the *hive* has become a knotty question; but the *perfect hive* is not yet invented. Who will invent it? From all the knowledge we have now attained to in bee culture, it would seem to me, as the most important thing, to first choose a frame of the size, shape and make to suit any sized hive, from a three framed nucleus to a 36 or 40 frame hive, so constructed, by means of a partition board, as to contract and enlarge the brood nest, according to the weather and the size and strength of the colony. I have tried different hives, and consequently different sizes of frames, until I am tired of it. I am now fast getting all my hives so constructed as to receive one size of frame. I find this a great convenience—a saving of time and trouble, such as the experienced alone can understand. But you will ask, what size of frame have you chosen? Well, for the present, I have chosen the common Langstroth, as has also "Novice." I like the new frame with metallic corners, invented by Novice, the best of all frames I ever saw, and intend to use them alone hereafter. So far as cap honey is concerned, Langstroth is right in the size of his frame. But as honey caps are becoming a thing of the past with me, I would prefer a frame one inch deeper and two shorter for the *extractor*.

I would like to write much more, but must remember friend Nesbit's warning, "bee short."

R. M. ARGO.

Lowell, Ky., Nov. 9, 1872.

North-Eastern Bee-Keepers' Association.

The third annual meeting of the North-Eastern Bee Keepers' Association was held at the Butterfield House, Utica, N. Y., Feb. 5th and 6th, 1873.

The association was called to order by President Quinby.

The roll having been called, the secretary read the report of the last meeting, which was adopted. The treasurer's report was presented and approved. The retiring president then read his annual addre s, which we present entire.

PRESIDENT QUINBY'S ADDRESS.

Two years ago, it was stated in the North American Convention of bee-keepers, at Cleveland, Ohio, that Mr. Quinby had accumulated a fortune by keeping bees. This was promptly denied, as far as dollars and cents were concerned. The term fortune is very indefinite as to amount of money constituting one. Some persons would have it with one hundredth part as much as others. And then again a fortune may consist in the accumulation of knowledge, wherewith the dollars may be gained in the future. In yet another view a fortune may be considered in the light of treasures laid up in heaven; in the satisfaction of having done something for the benefit of man, a perpetual reward. I hope I may have done or shall do something that way. The fact that a fortune was not secured pecuniarily by me, is, I think, owing to distribution as fast as accumulated. Whenever a fact was obtained that would benefit others as well as myself, it was forthwith given to all who would receive it. Those who did take it, did it very often so reluctantly that one would suppose they expected something would be given for listening to it.

Fifty years ago, when a boy, I heard a neighbor that kept bees talking to my father on the subject; who made this remark, "I believe that I could make an independent fortune out of bees." Here I got a lasting impression. Without waiting to under-

stand "how to do it," I solicited my father to obtain a hive of bees. It was put off indefinitely. Another neighbor, near us, had kept bees several years. I watched him with much interest. The simple box and gum were all he used. and his profit consisted in killing his bees and taking their honey to sell; and one season he realized the enormous sum of one hundred dollars. A few years later I had accumulated funds enough to purchase a stock of his bees to begin business on my own account; hoping to realize the fortune that I had dreamed about.

Yes, I was rich already; I was owner of a hive of bees. Yet it soon seemed like slow progress and bad economy to kill the bees for profit. Besides, it did not create the best feelings. It was suggested that by putting boxes on the top of the hive, with holes to communicate, the bees would fill them with honey, and retire to the hive below for the winter, leaving the contents of the box for their owner. Here was another chance for that fortune, an important point gained. It was no longer necessary to kill the goose that laid the golden egg, but she could be kept alive to lay the egg another year. Ninety-nine times in a hundred, the bees would provide for their winter stores before doing anything in the boxes. We had demonstrated the fact that they would store a surlus pover their wants. I immediately endeavored to persuade neighbors to save their bees and make double profits, particularly my old neighbor, whom I found very conservative. He had made money by keeping bees in the old way, and would not venture a change recommended by some one else, with the slim prospect of doing better. He even entertained the idea, and fully expressed it, that there was no better way than that practiced by his experienced self. Seemed rather annoyed—like some in the present day—that any one should try to do better; even predicted, that I would "potter" till I should fail entirely. I am not going to say that he would have preferred my failure, rather than that of his prediction.

Box honey, in market, began to take the place of that from the hives, and one pound of it sold for more than two of the other. We also found that boxes made of glass, in a fanciful style, commanded a still more ready sale. This fact I had nearly all to myself, and had I been as shrewd a money-getter as Astor, Stewart, or Vanderbilt, I might at least have secured a moderate fortune pecuniarily. Instead of which, having an eye to treasures of a less perishable nature, I wrote a book of instructions, which I hope has been of some use.

This was called a mistake, by some of my best friends. The middle men who distributed to consumers, called me a fool for doing so. "Don't you see that competition will reduce the price, and you will not get remuneration for what you have done?" Let these facts serve as an explanation, why one person has not become rich by keeping bees; but let it not discourage improvement.

Another class of bee-keepers have stopped at this point, forgetting where they got the first idea, having had it so long, it seemed to have originated with them, and not conceiving any further improvement possible, did not want any. "Had we not already caused two blades of grass to grow in place of one—two pounds of honey in place of one—and saved the bees. What more was there to be had?"

The bees had now betrayed what their instincts might lead them to, in the success of our first experiment.

The inside of a bee-hive had hitherto been considered a dark place, dangerous to explore. Mr. Langstroth gave us a view of the interior in a blaze of light. With this help, we could go still deeper in the study of their nature, and guide their instincts to still greater profit. It stimulated further experiment, and the introduction of the extractor demonstrated at once that we could do better still. We found by giving the bees combs ready to be filled, instead of putting them to the trouble of making them, and when filled, by emptying and returning again to the bees, they would sometimes be refilled successively several times in a season. With every step in improvement has come a host of patent venders, that seemed regardless of any improvement in bee culture, and anxious only to filch the dollar from the credulous. And following these, have arisen scores of disappointed, discouraged, disgusted bee-keepers; disgusted with the whole subject. This class we are unable to approach with any chance of success. We cannot blame them. They are not acquainted with our motives. They cannot understand how we, like the bee, can be "willing to work for nothing and find ourselves," and work not for individual good, but that of the whole community. When extremes are avoided, conservatism is commendable. I mention these things, not to discourage, but to show that there is yet much to hope for. Opposition to improvement has attended every step. Rejecting proffered blessings is no new thing. People did it 1,800 years ago. Being rejected does not disprove the truth of anything. The progress of the past, we trust, will be accelerated. There are many points in the natural history of the bee not yet understood; many theories to be verified by experiment. And let us remember that a failure often carries with it the most important lesson, by stimulating inquiry into causes of such failure.

The calamity that overtook our bees one year since, in all the northern states, was the severest of any in the past forty years. Some cause, or causes, must have operated to produce it with which we were not acquainted. We wish to investigate, to examine the different theories that have been offered. Where facts are given that render any one probable, it is then a duty to verify by experiment. I have offered a theory, and am experimenting to test it. I am not so anxious to prove that I am correct as to ascertain what is absolutely certain. I hope the committee to propose questions for discussion will remember this one. All of us have discovered that some few of our bees, in spring, are in much better condition than the others, and give us twice as much profit. We would like to understand how to make all as good as the best. When we have attained this result uniformly, we have taken another step in advance.

A progressive bee-keeper in Ohio writes me: "I think you will agree with me, that the time will come when we shall make bee-keeping profitable in the poorest seasons." Doubts of its ever being so does not decide it, but discourages efforts towards

its accomplishment. Simple belief that it may be so stimulates to exertion in that direction. Let a thousand enthusiastic bee-keepers start the inquiry, "How to do it?" and perhaps move in as many different directions, who can doubt that something will be discovered. If we are unable to see it, are we justified in continuing the effort? We must not suppose that we have examined all the evidence that has been presented to the thousand different minds, and judge as if it had all been examined by the small ray of light presented to our own.

Only a few years ago a friend out west, who had been to hear Mr. Morse lecture, wrote: "Who knows but we may be talking to you in a few years by lightning?" This, and more, has been accomplished. We can even hold converse with Victoria on her throne! Our diminutive intellect did not comprehend it, and would not, if we had endeavored to penetrate the future, at the time of Franklin's first guiding the electric fluid from the clouds. We cannot, even now, divine the manifold treasures which the future will yet unfold, aided by this agent. Here, again, we see that improvement does not stop with the first success. We have already started, with this principle in one direction, that promises much. Each colony of bees require, on an average, thirty pounds of honey to take them through the next season's honey harvest. When they have stored this, and no surplus, we propose taking it all with the extractor, and feeding the bees on coarser fare; something worth in market, one-half, one-quarter, or one-tenth as much as honey. The step already taken, is quite satisfactory. We want to ascertain the cheapest material possible, consistent with the health and well-being of the bee.

We know, that in some seasons, there will be times when the flowers will secrete honey in abundance, at other times very little, or none at all. It would be interesting to understand the conditions that produce it. Whether the elements are in the earth or atmosphere. Who knows but that some day we may control this, as the farmer increases his crops by the use of proper fertilizers. Let us inquire.

The farmer has inquired, if the flowers of clover and kindred grasses, when robbed of their sweets, are of the same value for dairying purposes? If the blossoms of the orchard will yield the same fruit when robbed of their sweet secretions? If the vineyard with its ripened fruit, is of the same value as without the bees? These questions should be carefully, fairly and honestly examined. We should also inquire if the farmer is aided by the agency of the bee in any of his crops?

I would suggest that, like some other institutions, we deposit some of our questions in a box, to be drawn out at random, and answered as best we can. I think we have no selfish, undivided interest among us to prevent our answering candidly and for the interest of all. Not one is bound to twist replies to suit any one's particular views, theory, or patent hive. Nothing like discussion for arriving at the truth. I proposed to the North American Bee-keepers' Society three questions:

1st. What caused the loss of bees last winter?

2d. Is it possible to improve the nature of the bee by judicious handling?

3d. Does the patent hive promote bee culture?

The first two were discussed, the third forgotten. A great many conflicting interests would come in, to discuss it there. Nothing here to fear from it. In relating an anecdote, I do not wish to insinuate that the subject was forgotten, but say I was only reminded of it. The groom, in recommending a horse to a purchaser, said he had three faults. What were they? 1st. The horse being white, shed some white hairs on his rider's new clothes, which looked badly. 2d. He plunged his nose in the water, on going to drink, so as to spatter water all over the new bridle. The third he could not think of, but it was bad, very bad. The bargain closed, the purchaser endeavored to lead him into the stable, when he nearly knocked his brains out against the door-post. Here, you rascal, this horse is as blind as a bat. Why did you not tell me? Oh! that is the fault I couldn't think of.

A unanimous vote of thanks was tendered the president for his able address.

ELECTION OF OFFICERS.

An opportunity to join the association being offered, a goodly number of new names was enrolled, after which occurred the election of officers for the ensuing year. The following were elected:

President, M. Quinby, St. Johnsville; Vice-President, R. Bacon, Verona; Secretary, J. H. Nellis, Canajoharie; Treasurer, J. E. Hetherington, Cherry Valley.

PLASTER OF PARIS HIVES.

After some unimportant discussion, Captain Hetherington was called on to give the result of his experiments with plaster of Paris as a material for the construction of bee-hives.

In reply that gentleman said that it had been claimed that the use of this material would cheapen the cost of hives. He did not consider this as important as other features. *First*, plaster of Paris being universally recognized as a non-conductor of heat, it would materially assist the swarm in maintaining an even temperature. *Second*, being made porous by increasing the proportion of water when cast, it was found to be an excellent conductor of moisture, and this would carry off the interior dampness of the hive. Both these were important features in an improved hive, and both qualities were essential in hives used for wintering purposes.

Captain Hetherington has experimented extensively during the winter, and the detailed account which he gave of his experiments was listened to with close attention and deep interest. He did not recommend the adoption of plaster of Paris on account of economy alone, but advised experiment with a view to adoption for wintering purposes.

The association adjourned until 7 o'clock in the evening.

EVENING SESSION.

The association being called to order, the minutes of the afternoon session were read and approved.

The association was addressed by Mr. Alexander. After listening to Mr. Quinby's address he had meditated on the fortune to which the president alluded. He thought the president's experience proved the truth of the promise: "Cast thy bread upon the waters and it shall return to thee after many days." The attendance at the association

demonstrated the growing interest. As the production of honey increased, the demand for it was found to increase proportionately. Success in any pursuit is measured by the magnitude of resulting good, and the pioneers of apiarian science have ample reason to feel satisfied with the result of their labors.

A LETTER.

A letter was read from Rev. W. F. Clarke, President of the North-American Bee-Keepers' Society, stating his inability to attend, and the same was put on file.

MOVABLE FRAMES.

The association took up the question, "Does this association think it advisable for farmers to adopt the movable frame hive.

Mr. Alexander, while not advocating the use of box hives thought some persons succeeded best with that hive, for the reason that they did not take care of their bees, no matter what hives they used.

Mr. Root said one reason why some bee-keepers succeeded best with box hives was because the hives were better shaped for the good of the bees than some of the patent frame hives in use. A hive should be nearly square. Many frame hives are too flat, and, as a result, bees winter poorly in them. The advantages of the frame hive are too many to mention. The following are a few points of superiority: The honey emptying machine can be used, whereby the yield of honey can be greatly increased. Again, stocks can be equalized in the fall, benefiting both the strong and the weak. Stocks sometimes have so much honey stored in their combs that they cannot cluster close enough to keep warm in winter. If frame hives are used, this honey can be removed. These are but a few of the advantages claimed.

Mr. Herrington, of Ohio, said that the moth worm could not be easily removed from box hives, and that the queen bee could never be seen or the bees handled. If combs became mouldy or mice got in the hive, there was no convenient remedy.

Capt. Hetherington said that where bees were never attended to, he would as soon advise the use of box hives as of frame hives. The man who neglects his bees cannot expect to make bee-keeping pay with either. He thought frame hives offered better advantages for acquiring a knowledge of this fertile science, and he certainly gave the preference to frame hives. The bulk of testimony stands preëminently in their favor.

DRONE COMB.

The next question discussed was the best time for removing drone comb from hives.

Mr. Root said it should be done when honey is being gathered, and the opening should be filled with a piece of clean, empty, worker comb. The bees then quickly weld the pieces together. The drone comb should be used in the surplus boxes.

TRANSFERRING.

In regard to transferring stocks from box to frame hives, Mr. Alexander stated that he had made artificial swarms more than twenty years ago. For making swarms, and transferring comb, he always threw a sheet over the box-hive, after it was inverted, which had a loop directly in the center. By taking hold of the loop and raising the sheet, an opening was made in which the bees found it very convenient to cluster. The sheet should be doubled until no light could penetrate it. The bees could then be put in a box until the combs were transferred. The hive is drummed, as in driving them into a box.

The association then adjourned until 9 A. M. next day.

The association was called to order at 9 A. M., pursuant to adjournment. The room at the Butterfield House was well filled, and the attendance much larger than on the previous day.

THE NORTH AMERICAN BEE-KEEPERS' SOCIETY.

Mr. Nellis offered the following preamble and resolution, which was adopted:

WHEREAS, Rev. W. F. Clarke, president of the North American Bee-keepers' Society, has issued a circular requesting bee-keepers all over the land to organize societies auxiliary to that; therefore

Resolved, That this association recognize the call and appoint delegates to attend the next meeting of the North American Bee-keepers' Society, to be held at Louisville, Kentucky.

Resolved, That the president of this association be instructed to invite all county or local societies of New England or this state, to coöperate with this association by sending delegates to attend its meetings, or by corresponding with its officers.

On motion of Mr. Root, it was resolved to leave the appointment of delegates to the National Society in the hands of the executive committee of this association.

PROFITS OF THE APIARY.

The question, "How may the greatest profit be obtained from the apiary; by increasing stocks, or by preventing the same?" was then taken up for discussion.

Mr. Sisson was in doubt as to which position to take. Raising stocks to sell at $20 each, or selling at moderate rates, made a decided difference in the matter. Where only a moderate price can be obtained, he would not advise an increase of stocks, but would endeavor to secure box honey, giving plenty of room. He used the machine exclusively, and can effectually prevent swarming by its use.

Mr. Root thought Mr. Sisson's position well taken. Bees should not be allowed to remain idle in attempts to swarm. He would recommend a moderate increase of stocks, one new from two old ones.

Mr. Sisson did not favor putting swarms in hives filled with empty comb, when box honey is wanted, as bees are not compelled to work by the necessity for comb, and are very uncertain in their efforts to fill the boxes. When the machine is used, he would use empty comb. When an increase of swarms is wanted, division should be made early. He would not, under ordinary circumstances, more than double his stocks, as greater increase was not usually safe.

Mr. Van Deusen had, during the past season, taken 167 pounds of extracted honey from one stock, and made three good stocks from what was at first but one.

TAKING IT EASY.

Mr. Sisson told of a friend of his who took stocks to California, and was offered $100 each for his stocks after his arrival. He refused to sell, but the bees finding that they could gather honey every day in the year, refused to gather any honey in store.

Capt. Hetherington had experimented somewhat in the matter under discussion. He considered the profits of non-swarming, and of moderate increase about equal.

Mr. Root stated that Mr. Barber had destroyed the desire to swarm by allowing the swarms to issue. After they cluster, he hives the bees in a box. He then takes all the frames except one from the parent stock. The boxes are then placed directly against this frame and the swarm returned to the hive. After 48 hours the other frames are put in the hive after destroying the queen cells. By this time the boxes are generally well filled with comb, and the desire to swarm is thwarted.

WHAT WAS THE TROUBLE?

The next question proposed was: "What were the causes of mortality among bees during the winter and spring of 1872?"

Mr. Bacon said the fall of 1871 was wet and cold, very unfavorable for bees. He put his bees in his cellar, very early, in consequence of the weather, and ventilated from the top. The result was the bees were very uneasy. After the meeting of this association last spring, he ventilated at the bottom of the hive, which seemed to improve the condition. Still bees were in wretched condition from the severity of the winter and the length of time they were confined.

Mr. Van Deusen said a neighbor of his wintered forty-six stocks successfully by putting them in a good warm cellar, and ventilating from below.

Mr. Van Alstyne thought the disaster in wintering came from the dampness of the autumn and the severity of the winter.

Mr. Nellis believed the damp autumn in connection with the long time during which they were confined, from October 1 to April 13, was the cause of the great mortality among bees. The honey seemed to be of as good quality as any ever gathered by bees.

Mr. Herrington thought impure air might aid the disaster among bees last winter.

Mr. Richards was of opinion that bees should by all means be allowed to fly during winter.

Mr. Sisson said stocks belonging to careless bee-keepers, kept in box hives, with no ventilation except that derived from the entrance, had been known to winter better than others in hives supposed to be better prepared for winter.

Mr. Nellis said one stock, stimulated to fly late in the fall, wintered better than any other stock in his cellar. He thought pure air not as important to bees as to human beings. Too much ventilation had been probably given frequently.

Mr. Quinby quoted the lately deceased Mr. Coe, who claimed that when bottom ventilation was neglected, carbonic acid gas was generated, very poisonous to bees. Mr. Quinby also read an article of his from one of the bee journals, in which was advanced the theory that suffering from cold is a primary cause of dysentery. Examples were given to sustain this point.

Mr. Van Deusen would let restless stocks fly in winter. For this purpose he places a stock, with the bottom board removed, over a gauze box, two feet square, in a light warm room. After they fly sufficiently, or at evening, the bees return to the hive. This has been found practicable, so far as tested. It also stimulates breeding.

Mr. Sisson said carbonic acid gas was poisonous to animal nature. It is heavier than air, and he thinks only enough downward ventilation should be given to allow its escape from the hive.

Mr. Tennant spoke of one of his neighbors who lost all his bees in a very cold cellar, while another neighbor, who kept his in a warm cellar, lost but two stocks. The bees were kept in hives of the same pattern.

The next question was: "What is considered the best artificial food upon which to winter bees?" Considerable discussion of no special importance followed.

The majority of persons present considered the best quality of white sugar the best for bees. It should be made into a syrup by dissolving four pounds of sugar in one quart of water. Bring it to a boiling point and skim.

SWEETS FOR THE SWEET.

Mr. Alexander thanked the ladies present for their attendance and congratulated them on their interest. He spoke of bee-keeping as a pursuit especially adapted to ladies, and predicted that after the pecuniary benefits reaped by Mrs. Tupper became generally known, more ladies would take up the business of bee-keeping.

The association adjourned until 2 P. M.

AFTER DINNER.

Association met at 2 P. M., Vice President Bacon in the chair. After the reading and approval of the minutes several matters of minor importance were discussed for the special benefit of individual members.

AMERICAN BEE JOURNAL.

The following resolutions were unanimously adopted:

Resolved, That the North-Eastern Bee-Keepers' Association regards the position of the editor of the AMERICAN BEE JOURNAL as the one best suited to develop the science.

Resolved, That so long as that position is sustained we heartily indorse that journal.

On motion of Mr. Alexander, the sum of $10 was appropriated to the Secretary for official services.

The time of the next meeting was fixed on the first Wednesday and Thursday of February, 1874. The thanks of the association were tendered the proprietors of the Butterfield House for courtesies, and the association adjourned.

[For the American Bee Journal.]

Introducing Virgin Queens.

MR. EDITOR:—I have been very successful in introducing virgin queens the past season. My plan is simple and in every case proved a success. Immediately after the swarms have left the parent hive, I enclose a queen in a cage, and put her in with a very small wax stopper, so that the bees can remove it in a short time. The principle is this,

at the time of swarming the bees are all in a fever and excitement, and to a certain extent demoralized, so that a stranger introduced then will not be noticed, and by the time they are settled down she will have the scent of the bees and be cheerfully accepted. I found them invariable fertile and laying in a few days. The queen cells which are closed should be removed from the parent hive, and transferred to the nuclei. They generally make better queens than those raised in small hives.

WM. BAKER.

Milford Station, Somerset Co., Pa.

[For The American Bee Journal.]

Bees in Minnesota.

EDITOR BEE JOURNAL.—When swarming commenced we had thirty stocks. The season, up to July, was poor. We fed 600 pounds honey. Commenced extracting July 16th. We used super-hives and empty comb in our Langstroth hives. Our bees are hybrids. We had a continual yield of honey up to about September 10th. We took 3,300 pounds with extractor, and have now 700 pounds sealed in our surplus combs—4,000 pounds total. We increased our stock, mostly by dividing, from thirty to fifty-six. We have now got our bees in the cellar—Nov. 12th. Last year we took 2,800 pounds of honey from twenty-two old stocks, and increased to thirty-two. We have beat "Novice," and that is glory enough for us. We believe the "*old age theory*" caused the death of nearly all the bees here last winter and spring.

HOW WE SAVED A QUEENLESS STOCK OF BEES FROM THE ROBBERS AFTER THEY HAD GOT WELL A GOING.

We took out the combs of honey, shook off the bees, carried the combs to the cellar till evening, leaving in the hive one comb for the bees to cluster on; at night the robbers had all gone home, then we brought back the combs of honey and gave the stock some brood to raise a queen from, put on a super to give air, closed the entrance to one-half inch; the next morning the robbers had to stand back. This was a strong stock, and the day before they had given up to the robbers and were not fighting at all.

We do all of our extracting in the shade of an oak tree, only a few rods from our bees. We have no trouble with the bees until after the yield of honey stops. We run our honey from the extractor into molasses barrels and set them in the barn; by the first of October it is grained; then I take the barrel head out and scoop out the honey with a sugar scoop. The honey has a coarse grain, the size of wheat kernels, the grain is soft and dissolves in the mouth like ice cream. We retail our honey, delivering anywhere within five miles, at only fifteen cents a pound. Our honey is mostly basswood and golden rod.

A word with "Novice." Do you use a ladder for the bees to climb from the top of the frames in lower hive to the bottom of frames in super—the space being about two inches. We can't saw the box apart with a bevel after it is nailed together, as you propose—we can't pass the corner; your hive and bottom being both beveled, when you move forward to enlarge the entrance the back part of the hive raises up, and leaves a space open on both sides, near the back end, large enough for moth worms. How much cheaper, easier, and nicer the Langstroth portico is than your lighting board, with its hooks? How much easier to enlarge or close the entrance with the entrance blocks than it is to pry up your hive (for the bees will stick it fast); to move it a little to enlarge the entrance, and then have to stand on your head to see if the entrance is the size you wish? These opinions we form by reading your article.

L. B. ALDRICH.

Warsaw, Rice Co., Minn., Nov. 13, 1872.

[For the American Bee Journal.]

A Risky Experiment.

MR. EDITOR:—Don't you think that we are too generally given to sound our successes and laud our actions as being mainly instrumental in the accomplishment thereof, while we ignore our failures and the causes producing them? Why we do so I know not, unless it be that our innate selfishness is gratified on the one hand, causing us to be more sociable and communicative; on the other hand, our reverses will cause us as it were to draw within ourselves, making us more reticent. I have found as a rule people do not like to expose their failures. If the correspondents of our B. J. would be more particular in giving us the whys of their failures, we might be able to guard, for instance, against such seasons as the past. I knew in season last fall that my bees would not do well, when they were put away, from the fact that I was not able to overhaul them. My practice is to take one or two frames out of full hives, dividing the space equally amongst the center combs, with the lower cells of the three center combs empty for the bees to cluster in; front entrance open three-quarters of an inch; from two to four eightpenny fence nails under the lids, according to strength of stocks, for upward ventilation. I have hitherto found it quite sufficient. My bees were put in the bee-house November 19th; they had been then exposed to two weeks frost with no upward ventilation, consequently the combs were covered with frost and the bees on the outside ranges of comb were then dead. The change from the cold to the warm bee-house of course thawed out the frost, causing dampness. Bees in such a state become restless, eat honey, and become gorged, not being able to fly out to discharge their fæces, become diseased—in fact we have the bee dysentery. The first thing I knew the bees were clustered outside the hives, while the floor was covered three or four inches deep. I slipped back the cover about two inches; that answered very well for the large hive, but the standard size would not be quieted. A tolerable fine day coming, I had eleven of the strongest carried out *at night*. The next day was too cool for them to take flight. They came out, discharging the fæces upon the hives, and at evening had gone in and become quiet. This partial success gave me hopes that I might save the balance, which still remained uneasy, and in a few nights after I had them all taken out and placed upon their permanent stands. I knew that it was against all rule or

precedent to put bees out at night, with the thermometer below zero. I had studied the situation and resolved to run the risk, basing my decision upon the assumption that the bees, if put out at night, would naturally go into their hives and become quiet by daylight. The result proved the correctness of my thoughts; the weather remained cold for three weeks, when they got a chance to fly. My bees were saved, but very much reduced in numbers.

F. CRATHORNE.

Bethlehem, Iowa.

[For American Bee Journal.]

How to Catch Absconding Swarms.

DEAR JOURNAL:—While recalling the various plans for hunting bees, it occurred to me to tell our brother bee-keepers of a very simple method to catch absconding swarms. The idea is new to me, and though some of your readers may know and practice this method, I have never seen it described in any bee journal.

The idea was imparted to me by a neighboring bee-keeper, who showed me two fine swarms he had thus obtained during the past summer. I propose to adopt the plan next season, and know that a great many of your readers will, also, if they should chance to read this, for it is a sure thing and not patented.

Should you enter a tract of woodland in a bee-keeping neighborhood, in the heighth of the swarming season, you will observe many bees searching closely around the trunks of the larger trees. When they find a cavity suitable for a future habitation, they return to the hive and are ready to guide the new swarm to their new home, if they succeed in getting away from the apiary, and we know that many do. Now, we want those swarms, and how are we to get them? Why, simply thus: Take a few old bee gums or box hives, nail bottoms to them, have a few small holes in the sides for entrances, and hang them up in a few of the large trees. If an absconding swarm enters the forest it is almost sure to enter one of your hives, which can be removed to your apiary at your leisure.

Don't leave any large holes in your decoy hive, if you do, squirrels are sure to enter also. My neighbor overlooked this matter, and found in one of his hives not only a swarm of bees, but also a nest of squirrels, all living harmoniously together.

SCIENTIFIC.

Hartford, Washington Co., N. Y.

[For the American Bee Journal.]

Travel in Italy.

(CONTINUED.)

Out of twenty-two queens that we had to take in the place where we were, we had only taken seventeen and rejected one when the sun set. I was of opinion that we should stop our work, but Sartori said that we should take the other four, as they were the last we had in this part of the country. These four queens were not in the same apiary. We had to travel about half a mile across a valley. When we arrived it was almost dark, and after we had taken one queen it was night. Sartori asked for a candle, and there he stood, holding the light over the bees, and silently taking off the bees as they stung him on the hands. This search lasted for about an hour and a half, and he found only two queens. His hands were covered with stings. "I have been in worse places," said he, as we were coming back. "I have been stung once almost to death, and since that time I am venom-proof." His father, who inhabits Tyrol, has always kept bees above the door of his house, like they do in Italy. Sartori, at the age of fifteen, was fond of looking at the bees and handling them. He made many experiments with them, so that after a year of bungling he had destroyed or killed the twelve hives which composed his father's apiary. His father bought bees again, but forbade his son to touch them. The latter, to satisfy his passion, bought two hives with his pin-money. One day, having climbed on a ladder, he tried to take one of his hives down, he slided it on the board to bring it on his shoulder, but as it was heavier than he had expected to find it, it slipped faster than he desired, and fell on him covering his head down to his shoulders. Thousands of bees immediately stung him. He descended slowly from the ladder, hastily rid himself of the hive, and plunged his head in a barrel of cold water. "I was taken by fever," said he, "and it lasted two weeks, but for three months I could not look at my hives without a shudder." This accident, far from disgusting him with bee culture, stimulated him; for, after this, bee stings caused him very little pain.

The next day our host waked us at two o'clock in the morning. Having slept only three hours, I looked at my watch and said, "I wonder whether he is not mistaken, for what can we do at this time of night?" "Oh," said Sartori, "we have to travel two leagues this morning, and it will take us four hours. So it did, for we arrived at seven o'clock at the first apiary that we were to visit.

The road that we had to travel followed the course of a large creek then dry. On each side arose large mountains, covered with divers crops and vineyards in the lower part, and with pine and chestnut groves wherever the naked rock was not to be seen. From distance to distance, on the highest peaks, I perceived the ruins of an old castle or the spire of a church, whose bell called the peasants to their daily labor. Most generally the churches were placed near the castles, the priests near the lords, who thus have but little trouble to go to the house of worship, whilst the peasants, who live in the lower parts of the mountain, have to work on Sunday if they wish to go to church, for it is really a work to scale such a mountain when the weather is hot and the path slippery.

On each side of the road we could see peasants plowing the ground with oxen. "Horses are not strong enough to plow our lands," said our driver. I was convinced of the truth of this assertion when I saw their plows. The plow that Cincinnatus left when he went to Rome as a dictator, was not more primitive. Fancy a beam, over six feet long, terminated at one end by a wooden curve, on the end of which is fastened the point of an iron spear. Above this spear is a kind of rough wooden shovel. A single handle, three yards long and sharp at its extremity, is fastened to all this. The whole is

heavy and badly made. To drive the oxen, the driver is armed with a light pole, ten feet long, with an iron point. I was shown a so-called American plow, but how different it was from the plows now in use in this country.

After having followed the creek for two hours, we had to scale for two hours more to arrive at our first halt. It is true that this station was the most distant of all that we had to visit on that day, the other stations being closer to Borgo Priolo.

A shoemaker, from whom we had bought six queens, asked us to take our breakfast with him. His wine was excellent, and had the bread been of good quality, we would have eaten a royal breakfast, for our *incettatore* had brought with him good cheese and sausage. I nowhere ate so good cheese and sausage as in Italy. They explained to me their recipe for sausage. Take as much pork as beef, hash the whole, add one pound of salt and one-half pound of ground pepper for every hundred pounds of meat, put in strong guts very tight and smoke it. The shoemaker's wife, seeing that I liked Parmesan cheese, offered me to taste hers. I accepted and found it good. She then began to explain how they made it, and to make me understand better, she brought the jar in which she kept it. I looked in but did not see any cheese. It was buried under a coat of maggots of all sizes. I then looked at what was left of the cheese I had tasted, and became convinced that I had innocently made hundreds of victims. It was too late. I drank a glass of water and hurriedly brought my mind to other subjects. All this is nothing but custom. In some countries the people eat fried grasshoppers. The shoemaker's wife was very clean and tidy. She had given us a tablecloth and napkins of radiant whiteness, and she was far from suspecting the astonishment and disgust that the maggots of her cheese had caused in my mind.

In Italy, as in Switzerland or France, in all the houses whose inmates are not altogether destitute, they use large and soft napkins, far different from the American napkins, so short and starched that one would as soon wipe his mouth with a piece of board or pasteboard. In England napkins are smaller than on the continent, but not so extravagantly small as they are in America. When I came to this country I sailed from Liverpool. When the hotel omnibus was ready to take me to the boat, I closed my trunk and looked around me to see whether I was not forgetting anything. I noticed a white piece of linen on the back of a chair, and supposing that it was my handkerchief, I took it and put it in my pocket. The next day only I discovered that I had stolen a napkin of the hotel.

During the breakfast the peddler boy asked me for the second time, whether I would be willing to bring him to the United States. "I would gladly do it," answered I, through Sartori, "if I were not afraid that you would repent of coming. Wine is dear in America." "What is it worth?" "More than $1.25 per litre." "I don't care," answered he, unwilling to show his deception. But he never again spoke of going to America. It should be admitted, indeed, that a population badly fed could not stand at work easily if they had no wine. During all this day we had not ceased going up and down the ravines of this hilly country. This work lasted twelve hours, for our breakfast supported us until nine o'clock P. M., and still I did not feel hungry, thanks to the grapes and wine so generously offered to us by every peasant at whose house we stopped. At first I tried to refuse, but Sartori having told me that these people were superstitious and considered the refusal of a stranger as a bad omen, I accepted and never experienced but a feeling of vigor necessary to perform our arduous work.

When leaving Milan we had calculated that the gathering of eighty-seven queens would take about two days, and we intended to spend the next day, which was Sunday, at the house of a bee-keeper of Alexandria. But we had not taken into account the time necessary to go from the railroad station to Borgo Priolo, and the interminable journeys across the ravines and over the rocks that we had to scale like goats. The *incettatore* had assured us that there was not more than a quarter of an hour of walk between each apiary; but the hours of Piedmont are as interminable as their leagues. The population knows but little how to estimate the length of an hour. How could they know it? They have no clocks in any place. In Milan I saw clocks on all the public buildings, but I saw only one with two hands, all the rest had but one, and very often it did not work. It is so sweet to let the hours roll without counting them! This pleasure is better appreciated by Italians than by any other nation in the world.

The next day being Sunday, we had about twenty queens more to get, I supposed that we would leave them, but Sartori told me, although he is a strong Catholic, that nobody would be offended. Indeed, the population of the villages that we visited followed us from one apiary to another. Men, women, children, all wanted to see us work. "Tell them that they will get stung if they remain around us," said I to Sartori. "Leave them," answered he, "we will laugh." Truly it was a laughable sight for the most sober mind to see the *sauve-qui-peut* when the bees assailed the most inquisive of the crowd. The noise, gestures, races, contortions, would have been a fit subject for the pencil of Teniers.

CH. DADANT.

Hamilton, Ill.

(To be continued.)

[From the San Diego Daily Union of Nov. 21, 1872.]

Apiaries in San Diego, Cal.

EXTENT OF THE APIARY BUSINESS IN THIS COUNTY—ESTABLISHED SUPERIORITY OF SAN DIEGO HONEY—PROFITS OF THE BUSINESS—PROBABLE FUTURE OF THE INDUSTRY IN SAN DIEGO.

The honey bee was introduced into this State from the East as early as March, 1853, but the apiary business attained no great importance until several years later. The persons who first attempted the introduction of the bee into California met with many difficulties. Their inexperience in shipping the insect so great a distance, and through hot countries, caused them to suffer severe losses. In some instances entire shipments of hives were ruined by the destructive worms which had been hatched on entering the warm climate from the eggs laid by the moth previous to starting.

To Mr. J. S. Harbison, of the firm of Clark & Harbison, is due the honor of developing the apiary business in California to that prominence which it has attained. When nearly all who had made experiments in importing bees united in saying that they would not thrive in California, he differed with them and took measures to further test the matter.

In the fall of 1855 he sent east and had one hive of bees brought out, which arrived at Sacramento on the 1st day of February, 1856. Though most of the bees died or escaped on the passage, enough remained to prove that, with proper care and attention they could be imported with little loss, and that they would increase and make large quantities of honey when brought here in a proper manner.

The subject occupied the chief portion of Mr. Harbison's attention for nearly two years. At the expiration of that time he determined to go east and personally superintend the shipping of some hives. With this object in view, he left California in May, 1857, and proceeded directly to Lawrence county, Pennsylvania. Here sixty-seven hives were taken from his Lawrence county apiaries, (Mr. Harbison had already engaged in the business in the East), and got in readiness for the long trip to California by way of Panama. At Aspinwall, Mr. Harbison judiciously opened the hives and allowed the bees to fly; a procedure which benefited them greatly, no doubt contributing to their good health during the remainder of the voyage. Even with all the care and attention bestowed upon them, but few of the hives arrived in good shape. Mr. Harbison proceeded east again the following year—1858—and brought out another lot of hives with a little better success.

These two importations, together with a third in 1859, were sufficient, however, to start the business and demonstrate its profits. Others ventured to engaged in it, and soon apiaries became numerous throughout the state. Over 5,000 hives were imported during 1859-60, by different persons. Mr. Harbison kept the lead, however, and earned the distinction at that early day, of being the most enterprising and best informed apiarist in the state.

As soon as it became apparent that honey making would pay, those interested in the business began to cast around to obtain the best kind of bees. Mr. Harbison was foremost here again. In 1865 he went east, and on his return brought with him selections of Italian bees, made from the most noted apiaries in the eastern states, and also seventeen of the choicest queens he could find. The hives of Harbison are now composed entirely of the very best honey making bees.

Mr. Harbison is engaged in transferring as rapidly as possible, his entire stock of bees to this county, recognizing the advantages it possesses for the apiary business. The firm has now established in this county four apiaries, with 1,180 hives. All the bees are of the highest and most improved breeds, and the honey produced by them is whiter and purer than any produced eleswhere in the state. For three successive years a first premium has been awarded to Clark and Harbison for their San Diego honey, by the State Agricultural Association. Notwithstanding the fact that nearly sixty specimens were exhibited at the last State Fair, the judges, in making their award, said that they experienced no difficulty in deciding, as that from San Diego was unquestionably superior in every respect to all the other honey exhibited. The specimen that took the last prize has been sent to the International Exhibition at Vienna, and will unquestionably receive a premium there.

The quantity of honey exported from San Diego last year was 27,600 pounds. The export this year will probable be twenty per cent. in excess of last year, and it is confidently expected that the quantity for shipment next year will fall very little short of 100,000 pounds. These expectations are of couse based on the probability of our having a wet season. In any event, wet or dry, the shipment will not be much less than 60,000 pounds in 1873.

Although Clark & Harbison are by far the leading apiarists in this county, they do not monopolize the business by any means. It is a noticeable fact that during the past year this firm sold nearly three hundred stands of bees to farmers in every part of the county. Nearly every ranch in San Diego is now an apiary on a small scale; the surplus honey which will be produced by these many hives of bees scattered all over the county, will add greatly to the quantity for exportation next year. From present indications it is safe to predict that the superior advantages enjoyed by this county will, in the course of two years, entitle it to the rank of the largest producer of honey in the state—it has already made its reputation so far as quality is concerned.

Honey as Medicine.

The *Herald of Health*, in reply to the question, "is honey wholesome?" says, "yes, used in moderation, it is. Very old honey, however, should be eschewed. A German teacher has lately written a work on the subject of honey and its healing properties. While he may over-estimate its value, what he says is interesting. We quote: 'A strong influence for publishing this book was the fact that I, a sufferer from hemorrhages, already given up to despair, and at the verge of the grave, was saved by the wonderful curative powers of honey; and now, thank God, I am freed, not only from weakness of my lungs, but rejoice in the possession of perfect health.

'At my first attack, upwards of thirty years ago, powders and tea were ordered for me, which benefited me but little. I then placed but little confidence in honey, which I had used occasionally, and in small quantities. Judging from my present knowledge, I believe that the honey was the only remedy that was doing me any good, and it is this that I have to thank for the gradual, the sure restoration of my health.

'As my disease increased I began to use cod liver oil, which weakened and injured my stomach so that I could hardly digest anything more, and my condition became worse and worse. Again I returned to honey, when my suffering immediately began to decrease and disappear. Besides the use of honey, I took pains to preserve my breast and lungs from injury, which, in my trying situation as

public teacher, was almost impossible. My disease being caused by my constant teaching during so many years, I gave up my profession, and honey was my only medicine, whereby I, by the simplest, safest, quickest and pleasantest manner (for I was fond of honey), relieved the disease in my throat; and out of thankfulness I now write this book for the use and benefit of many, especially for the use of those suffering from diseases of the throat and lungs."

NOTE BY ED. A. B. J.—Many of our readers will recognize the above quotation as part of an article of considerable length, which appeared in last November's JOURNAL. We reproduce it here under the high medical sanction of the *Herald of Health*, in reply to enquiries made to us as to whether honey is good for persons of consumptive tendency.

[For the American Bee Journal.]

Review of the December Journal.

MR. EDITOR:—I am again highly pleased to receive the JOURNAL. Novice leads off as usual. That is all right, for if he did not we would not begin to read at the first page, but turn to where we found him and begin there. Novice is certainly mistaken when he says Mr. Leuthe, and every other bee-keeper, can certainly get a barrel of honey from every ten stocks in the poorest season, and that it looks bad to see so many correspondents telling about poor seasons, "the poorest ever known," &c. I did not keep an exact weight of honey this season, but it was just about five hundred and fifty pounds, from thirty-one stands, in the spring, and I used the extractor exclusively and more freely than I ought to have done; though the flowers were never more abundant. Never did I know such abundant autumn bloom as we had this year, and yet it contained no honey.

Those who have read my article in the December number, dated Sept. 10th, will see that I expected to have to feed back as much as I had taken away, if the then abundant bloom did not furnish the bees with honey. I had to feed back in sugar syrup far more than I had taken away. Honey was very abundant for about two weeks at the time I was extracting, so I got deceived, and, *Novice-like*, extracted all out of almost every hive that I extracted from, thinking the season would continue good, and the bees would fill up again in a few days. But a sudden end to the season taught me a very valuable *lesson*, which I shall ever heed hereafter. That is, to always leave the four middle frames, or about at least fifteen pounds of sealed honey, in case the season should suddenly end. Now, I would ask Novice how I could have got a barrel (375 lbs.,) from every ten stands under these circumstances. Does not almost every report from Canada to Iowa, and also south, agree that the flowers the present season contained little or no honey, and has Novice forgotten that *bees do not make honey* but *gather* it, and as the flowers did not secrete it this year in every location, how could the bees gather it?

Next comes the Bay State hive, that with Alley's piece on page 128, I will answer to night, under the head of Bee Houses.

Dronings, in the present number, is sound in his bee doctrine.

No one will fail to read the "Chatauqua Co. Bee-keepers." To notice many items of interest in it would extend my present piece too long.

C. S. Rogers wants to know from some experienced importer of Italians about Ed. Uhle's queens, &c. I also want the same information, having received two queens last year, in July and August, from Uhle, and bred a lot from one of them at a time when there was not a black drone living. The mother and every one of her daughters were *pure hybrids*.

Next comes the New Idea hive. I am inclined to believe from experience, though not in any new idea hive, but the principle, that bees will store three times as much in the main body of the hive, near the brood, as they will on top with a honey board intervening, or on sides with a partition board. I have six double Langstroth, but never got any good out of them only when I give the top one empty combs to fill. If any one thinks I never had the New Idea in my head before, let him come here and I will show him a New Idea hive I made June 1, 1870, and transferred bees into it the same evening, and would not give it for any other hive in my apiary. But I give Adair and Gallup the credit of putting empty frames in the middle. I had never thought of that which I consider the main gist of the whole idea. There is still, however, a difficulty to be overcome which I would like to state to Adair and Gallup. When you put empty frames in, how do you prevent the bees building drone comb in them? In taking out full frames to make swarms and replacing empty ones, in six cases out of ten, I get drone comb, no matter what the age of the queen is, unless I previously insert half an inch thick pieces of worker comb on the top and sides of the frame as guides.

M. Malin tells us how to get straight comb. A bee-keeper is very stupid who cannot get straight comb.

Well, Mr. Cameron, I think the winds of Kansas are so strong that bees will never flourish there. I have sent bees there several times, and the winds blow them away.

Here is friend Novice again on page 133. He is right this time, and proposes to keep right through 1873. This has always been my aim, to give both sides, the dark as well as the bright. I did my best with bees this year, and wouldn't say I got a barrel from every ten stands, as Novice says I could have done. As great bee men as Novice, who had no better season than I did this year, will say they have done no better, if as well. Did not friend Burch think my calculations of the amount of honey and increase of bees for this season, if it was a good one, very large? I still think I can do better than that calculation in a real good season, with the same number of stocks.

My article is getting too long, so I will hurry over to friend Burch on page 142, and close. Well, friend Burch, do you know what you are doing, when you tell us what A. C. Balch says he has done by forced fertilization? I fear it will be

read by forty-nine doubting Thomases out of every fifty, and *I confess myself one of them.* I have tried the same thing many a time since 1868. I have seen queens unable to fly come and make the attempt. Have picked them up and held drones to them as Mr. Balch did, also have held drones to them without touching them. Have caught drones just leaving a hive, in a dish cover, without touching the drone, and put the dish cover down on a queen in the grass on her way to meet the drone that I had not touched, and for all this it was nothing but "vanity and vexation of spirit," a total *failure.* Friend Burch puts the question, "How did he (Mr. Balch) knows this was so?" and then goes on to answer it, but he didn't—at least he didn't satisfy me. If Mr. Balch can convince me that it is a success, and will write to me giving me full instructions, so that I do not fail, I will send him the first dozen queens fertilized by his process as early in the spring as possible. Mr. Balch should remember that my southern location will enable me to send them several weeks sooner than he can get them in the North. Hoping that Mr. Balch will convince one doubting *Thomas*, I remain the JOURNAL's friend. R. M. ARGO.

Dec. 2, 1872.

Brief Reports, &c.

Mr. Samuel W. Lond, of Virden, Ill., says: "Last season was hard on the bees. At least three-fourths of the bees in this part of the country are already dead. I have lost but six colonies out of thirty; but then I have read the AMERICAN BEE JOURNAL for several years, whereas, my neighbors don't think it pays to take a paper devoted to apiculture."

P. S. to "Novice's" article, Feb. 15, 1873, ask Mr. Kellogg, page 188, if those colonies that had "empty combs all summer" were strong in bees early in the season? We never knew a season in which *powerful colonies* would fail to get honey.

Tell Mr. Hosmer, same page, that bees all hatched before September are now *perfectly healthy* on the sugar syrup diet, and that young bees, side by side with *natural stores*, have some dysentery.

J. P. Fortune, of Bloomfield, Iowa, says: "I want a fumigator, one that will burn if it is not in use for a few minutes. There are some that will, burn and do very well so long as they are in use, but as soon as the operator quits blowing through them the fire goes out. Who has one that won't 'hang fire?'"

ANS.—Get "punk," (*i. e.* hard wood that has the dry rot). It will hold fire a long time, make a smoke without blazing when blown, and is always ready for use if kept under cover.

Henry Hudson of Fennville, Allegan Co., Mich., says: "We bee-keepers don't want the space which we pay for filled up with personalities, wranglings, criminations and recriminations of speculators in patent humbugs and queen bees, to the exclusion of the practical experience of enterprising honey producers. What if old father Wagner was so forbearing that the big boys rather ran over him? I hope you won't follow in his footsteps in that respect. If they want to vent their spleen, let them have a "Wranglers' Department," and done with it; but make them pay you for it, like other advertisements, and not use our paper and money to do it with.

It is a pity, for consistency sake, that "Novice," after calling down the vengeance of the whole tribe on his devoted head for exposing them so long, should go into the axe-grinding business; but then as he pays so liberally for the use of the stone as well as power, by his preëminently valuable contributions, and as he hits right and left, but always squarely, why let him hit, if he does grind, for he does it all in good part, and then he has gone to work and got a little grindstone of his own, and proposes to grind out the flour and bolt it too, so we can get of him none but the best superfine flour. Therefore I, for one, say let *him* grind, and let Gallup punch him now and then to call him out."

"Novice" writes, under date of Feb. 17, "Colony, with natural stores, that have soiled hive, quilt and comb so badly, are also crawling out of hive with bodies distended. We have taken them out of the house and find plenty of eggs and brood, but more than half of what was a large colony of bees, dead. They also raised brood late in the fall on account of liberal feeding.

"The one by its side, containing *only old bees* and an *unfertile queen*, is in perfect health, having lost almost none, of what did not exceed a quart of bees in September, but having no other stores than sealed *sugar syrup*, which was given them in combs from the 'barrel feeder,' their own combs having been *all* removed."

H. S. VanAnglen, of Waverly, Lafayette Co., Mo., writes:

"An acquaintance of mine speaks of 'Novice' thusly, 'On what meat hath this our Cæsar fed, that he is become so great?' It is true that 'Novice' is becoming *slightly arrogant*, but I say, let him *ventilate* thoroughly through the A. B. J."

C. A. Camp, Painesville, O., writes: "As a general thing, apiaries in this locality have suffered much from the extreme cold."

J. R. Gardner, of Christiansburg, Va., writes: "I am happy to see by the late numbers of the JOURNAL, that it has fallen into such clever hands. May it long continue the 'Queen' of bee journals, and not go into any particular hive and become a 'king.' Let us have nothing more pretentious in the way of a hive connected with it, than the one that now adorns its cover."

D. M. Miller, of Mercer, Mercer Co., Pa., writes: "As for the bee business, it is gone up Salt River—it is *dead* in this country."

[We insert this piece of startling intelligence, to wake friend Hoagland, that we may hear from him.]

M. H. Milster, of Frohna, Perry Co., Mo., writes. "My time for the AMERICAN BEE JOURNAL has expired with this month. I have received my last number, and wishing to continue, send my subscription. I am much pleased with the JOURNAL. I am not discouraged with bee-keeping, notwithstanding my bad luck. I have lost eleven stocks this winter with dysentery. The last season was tolerably favorable, and hoping for better times, I will continue my search for knowledge into the hidden things of bee life."

THE AMERICAN BEE JOURNAL.

Chicago, March, 1873.

Mr. Langstroth's Patent and Suit

We receive a number of letters inquiring whether Mr. Langstroth's patent is to be extended, and whether the suit is given up. The best reply to such questions will be to quote the following passage from a recent letter of Mr. Langstroth's: "I have made no application for an extension of my patent, and it will soon be public property. Sickness, etc., has caused great delay in the prosecution of the suit, but it is not given up, and I am confident that the verdict will sustain my patent."

More Unavoidable Delay.

We must still crave an exercise of patience on the part of our readers and correspondents. February was a short month, it generally is; and half of it was consumed in an unavoidable visit to Canada, to settle up our affairs. The consequence is, that we are in arrears with correspondence, and late in getting out the March issue. We find that owing to a glut of mail matter, caused by simultaneous arrival of storm bound trains, our February number lay some days in the Chicago Postoffice. When there is a plethora of mail matter, periodicals must wait. Letters, dailies, and weeklies have the right of way. We suppose this is proper enough; but of course it isn't pleasant for our subscribers to wait, nor for us to get letters asking "Why doesn't my JOURNAL come?" or "Pray let me know what time in the month I may look for my JOURNAL?"

Too Kind!

Our friends are pouring in their favors in the way of communications at such a rate that we are bewildered and overwhelmed. Gallup, for example, took such a fit of writing, that *on one day* we got no less than *ten* separate communications from him! A few days afterward he wrote, saying, "I suppose you received my shower of articles." A "shower!" It was a storm, a hurricane, a perfect tornado. We shut the hatchways, put on the tarpaulins, and set the pumps at work, but the good old A. B. J. hasn't righted herself yet. We have hopes, however, that she will, in time.

Addresses.

Correspondents are particularly requested to be careful in giving their addresses in full, including county and state. In several instances, we are unable to rectify our books and lists, for want of *exact* directions. In one instance, the opposite mistake has been made. We have received $2.00 from Evansville, Wis., without the sender's name. Probably, however, we shall soon have a letter asking if we got that $2.00, for we find many people are in such a hurry to know that their money is safe that they cannot wait until the next issue for the acknowledgment of it. It would save us considerable annoyance, if we could acknowledge receipt of monies by telegraph.

A Good Bee-Feeder.

Bee-keepers in want of a cheap, handy, effective bee-feeder, will find one advertised in our present issue by Mr. C. C. VanDeusen, of Sprout Brook, N. Y. We used it last season in our apiary, and liked it much.

To Canadian Bee-Keepers.

Canadian bee-keepers who receive a specimen copy of the AMERICAN BEE JOURNAL and desire to subscribe for it, will, until further notice, send their orders and remittances to W. F. Clarke, Guelph, Ontario.

☞ The article on "Spontaneous Generation and Parthenogenesis," which occupies the first place in the present number will well repay a most attentive perusal.

☞ The advertisements of Will. R. King and others were too late for this month's JOURNAL, and we earnestly request our advertising patrons to send their favors in good season for the April number.

☞ "Bees and their Management," by Mrs. E. S. Tupper, is an excellent little manual for beginners in bee-keeping. See advertisement.

☞ Mr. A. C. Atwood, Vanneck, Ontario, Secretary of the Ontario Bee-Keepers' Association, has bought out the interest of Mr. J. H. Thomas, in the Thomas hive, the *Canadian Bee-Keepers' Guide*, etc., and expects to expand his bee business considerably the coming season. His advertisement will appear in our April issue.

Death of Mrs. Langstroth.

The numerous friends of Rev. L. L. Langstroth will be pained to learn that he has recently been sorely afflicted in the sickness and death of his estimable wife. In a private letter, dated Feb. 1, Mr. L. says of his deceased companion: "She had an illness of only ten days, and we buried her

a week ago. Her end was peace and joy. She retained her consciousness fully until about an hour before she gently fell asleep in Jesus. It pleased God to grant me restoration to health, and I was able to be with her every night but one."

We expected to receive a full obituary notice of the late Mrs. L. for insertion in our present issue, but a letter from Mr. L. says: "The obituary is not yet sent to me by the friend who is preparing it, and it cannot appear in the March number; perhaps it may not be best to insert it at all in the A. B. J. I have written some account of my dear wife's sickness and end for an old Yale friend, which he will send you for your private perusal." Several passages in this account are so beautiful and touching that we trust Mr. Langstroth will pardon the liberty we take in transferring them to the A. B. J. They will, we are sure, be read with interest by all.

"My dear wife's sickness was only ten days, but she has been an invalid for the last fourteen years, and just previous to her last sickness she had lost her strength and flesh by a cruel felon which left her without any use of her right hand, and no prospect that she would ever again have any good use of it. Her sickness began with a violent nervous chill, affecting at first the brain, but during most of her illness she was in perfect possession of all her faculties. She died as she had lived, full of faith and love, and able to comfort us all by repeating the precious promises of God's word. Sorrowing as we do that we shall see her face no more, we rejoice that she has entered into her rest, and that we have the rich treasure of her unselfish and holy example. From a child she delighted to store her memory with the Holy Scriptures and the sweet songs of Zion. At the death-bed of her father, an intimate friend of our dear Dr. Taylor, she said (when not six years old,) to her mother: 'To see dear father so happy reminds me of the hymn,

Jesus, the vision of thy face
Hath overpowering charms;
Scarce can I feel death's cold embrace
While folded in thine arms.'

Her mother told me that when she repeated these lines her father drew her down to him and kissing her said: 'Precious child.' How early she entered upon her life work of consoling the afflicted. 'Precious child!' Precious sister, precious wife, mother, grandmother, friend! Surely it was such a character, intimately known and loved, that inspired the pen of the sacred writer:

'The heart of her husband doth *safely* TRUST in her, for she will do him good, and not evil, all the days of her life.

'She openeth her mouth with wisdom, and in her tongue is the *law of kindness*.

'Her children shall rise up and call her blessed; her husband, also, he praiseth her. Many daughters have done virtuously, but *thou excellest them all*.'

At one time during her sickness she became unconscious, her extremities grew cold, and we gathered around her bed to see her breathe her last, but after some hours she revived, and opening her eyes spoke of the blessed sleep God had given her, and her mind taking in at once the situation, she said to me: 'Those lines of Hood, dearest:

We thought her dying when she slept,
And sleeping when she died.'

If you are familiar with the piece, beginning with the words,

'We watched her breathing through the night,
Her breathing soft and low,'

you will see how touchingly she expressed her perfect consciousness.

In nearly thirty-nine years of acquaintance I never knew her, in a single instance, deliberately to prefer her own happiness to that of others. Similar is the testimony of sisters, brothers, and all who knew her intimately. About an hour before she died she fell into a gentle sleep, and woke to find herself beyond the Jordan. God granting to her a desire often expressed, that she might thus peacefully fall asleep in Jesus."

Our sympathies, and those of our readers generally, are with our dear friend in this his greatest earthly trouble. May he be enabled to say, "Good is the will of the Lord." "God is our refuge and strength, a very present help in trouble."

[For the American Bee Journal.]

Bee Stands and Bottom Boards.

DEAR BEE JOURNAL:—Some of the writers of the JOURNAL recommend, and practice, placing hives upon the ground, with only a two-inch strip under the bottom board. I prefer placing my stocks on stands about twenty inches high. My reasons are: first, the stocks are kept dryer by a little elevation; second, they are much more convenient to examine; and thirdly, we avoid the annoyance of skunks and toads. My stands are made as follows: Take four square posts twenty inches long, three boards the required length, (say five feet), and one foot wide, and two boards twenty-six inches long. Nail the long boards to the posts, letting the square ends come even with the posts, then nail on the end pieces; next nail the remaining board in the centre, (edge up), even at the top with the sides. Such a stand will accommodate two hives, if the hives are painted different colors. The bottom board of the hive then rests on the edge of three one-inch boards. Such a stand, when well nailed and properly adjusted, stands very firm, and the bottom of the hive coming in contact only with the edge of the boards forming the stand, but little opportunity is offered for the harboring of moths and ants.

In regard to bottom boards—a stationary bottom board (except on small nucleus hives) is an intolerable nuisance, not to be thought of. For more then twenty years, I have used a bottom board similar to that described by Novice, if I understand him. The idea of so constructing it, was gathered from the work, "Bevan on the Bee." I first used it under box hives, but retained that form of bottom on adopting the Langstroth hive. My hives are twenty inches from front to rear, (outside measure,) with inside lower edge of front and rear beveled to near an edge, *outside* of sides beveled also, bottom board twenty-six inches long. At twenty and one-half inches from rear end, start

the entrance two inches wide and running to six or seven inches in width at front end, also increasing the depth of cut to one-half or three-quarters of an inch, making a V or triangular shaped entrance. The advantages are, that by simply sliding the hive back it may be effectually closed, or it may be contracted or enlarged at pleasure. To give a populous stock sufficient entrance and air in very hot weather, we raise the front end of hive and insert blocks three-eighths of an inch in thickness.

W. J. DAVIS.

Youngsville, Pa., Oct. 14, 1872.

[For the American Bee Journal.]

Gallup's Explanations to Wurster.

Mr. C. Wurster, on page 137, December number, seems to wish for an explanation. In my own hive, the combs run lengthwise of the entrance, as I failed entirely a few years ago with combs running across the entrance. But Mr. Adair's "New Idea" runs across the entrance, and he claims that a new swarm placed in said hive will commence the brood nest near the entrance. Here he is correct, but after the brood nest is once established, we must move it to the rear, or into the centre, and then a strong stock will build both ways, or both front and rear of the brood nest. I am inclined to think that they are more apt to build towards the front than towards the rear. But if we have the hive four feet long, and after placing the brood nest in the centre, the bees are inclined to build too much to the front, we can reverse the hive, and bring the other end to the front, as I make both my own hive and the "New Idea" with entrances just alike in both ends. Now, Mr. Wurster, you will see that by keeping the brood nest in the centre of the "New Idea" hive, the bees will not starve in winter, as they have plenty of honey both front and rear of the cluster of bees.

I think in that form of hive they would not move to the rear in winter, but move towards the front, if at all. If what Mr. Adair claims for this form of hive is correct, we certainly ought to be willing to give it a fair and impartial trial. Mr. Adair and myself have arrived at the same conclusions in many respects, and both at about the same time. I am inclined to think that the same results can be obtained to a certain extent in both the "New Idea" form and the square or twin form of hive, but the twin form is the most expensive hive, and will require more manipulation than the "New Idea" form, even when both are of the same capacity of 32 combs each. But as I have said before, it will require a better season than the past for a satisfactory test, and it is of importance that it should be tested by impartial persons in different localities. Four feet is not one particle too long for my locality, and if I was going to start with new combs and new hives, I should make the hive so as to hold the same sized combs as Mr. Adair's, and still retain the same length of hive. My combs that I now use, are the same depth as his, but two inches narrower. With Mr. Adair's sections or comb frames, with a half-inch thick side bar to the frame, the queen does not usually deposit eggs to within one inch of the wood on each side. Therefore I get as much width of brood to within an inch as he does in a comb two inches wider. The side bars to my combs are only about one-eighth of an inch thick, consequently the queen will deposit eggs in the very outside cells. We have used zinc side bars, but thought them too cold. But perhaps it was only a notion of ours after all. Now, please take notice, that we never like to have our hives filled up with great big bungling sticks, improperly nailed together for our bees to brood. You will readily see that it is impossible to nail down through the top bar into our side bar, as they are so thin, consequently, they always have to be nailed right, and then are never pulling to pieces. So we don't want Novice's tin corners, and could not be bothered with them at any price. Mr. Editor, isn't "Novice" trying to get his fingers into our pockets a trifle, with his tin corners, tin teakettles, bed quilts, pillow cases, honey knives, and twenty-five cent magazines? E. GALLUP.

Orchard, Iowa.

[For the American Bee Journal.]

On Extracted Honey and the Proper Manner to Put it Up for Sale.

The use of movable comb hives and honey extractors, and the consequent increased supply of honey, has brought into existence new industries, such as the manufacture of glass honey-jars, corks, labels, tinfoil caps, etc., for putting the honey in salable shape, or packing it for transportation. Everything in the line of articles above mentioned, I can furnish from this city at rates as favorable as they can be bought at any other point.

The best shaped honey jars, in my estimation, both for sale and for packing with the least waste space, are square jars, containing one or two pounds of honey. I shall have on hand for next season a large lot of these jars, with the imprint, "One or two lbs. Pure Honey," respectively on each jar, with suitable place for label. I also furnish corks and tinfoil caps, and labels with blanks left to insert producer's name and address. Or, if ordered in quantities not less than 1,000, I can, at a slight advance, have the address printed.

After the jar is corked, press tinfoil cap over the cork and neck of the bottle with your hand first, and then finish with a leather strap about five-eighths of an inch wide and four feet long, one end of it fastened to the wall. The strap should be wrapped once around the neck of the bottle, and while one end is held tight by one hand the bottle should be passed forward and backward until the tinfoil is properly smoothed down. For my own use I have made a "horse," so I can sit down to the work of capping my jars, keeping the strap tight with one foot, and using both hands on the jar.

For shipping, jars should be packed tight with sawdust, and one dozen in a box specially made for the purpose. A bee keeper should sell by the gross his one or two pound jars of honey to merchants in the country or city, or have it sold on commission until his brand is known. With his label on

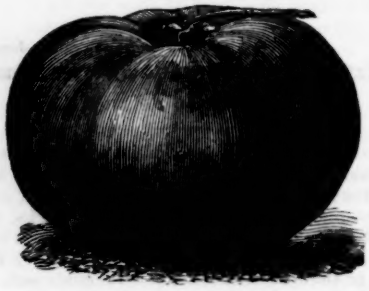
jars and his brand on boxes, he will soon find a market if he bottles a choice article only. Good honey put up neatly and in small quantities will always bring the best price, and it is my experience that *machine extracted* honey is the preferred article if the consumer is once convinced of its purity.

A manufactured article of Cuba honey finds a ready market in our cities, because it is put up in merchantable shape, *i. e.* in jars, nicely labeled and styled "White Clover Honey." Now, I claim that the sale of a manufactured article would not be possible if our bee keepers would only take the necessary pains to bring into market, in proper shape and under their own names, their *machine extracted* honey, which is the only pure honey possible, and if once known to consumers will be the only honey in demand.

For list of prices, see advertisment in another column, and for further particulars, address

CHAS. F. MUTH.

Cincinnati, O., March 1, 1873.



Canada Victor Tomato.

This is a a new tomato, concerning which Mr. J. J. H. Gregory says: "Last season a gentleman residing in Canada sent me a glowing description of a new tomato. I wrote asking for a pinch of seed that I might test it in my experimental garden,—a tract of land of about three-quarters of an acre, which is pretty well filled every season with varieties of new vegetables my numerous correspondents kindly send me for trial. I planted these on my ground, anticipating the usual result, a tomato with some very good characteristics, but on the whole not superior to some kinds already before the public. About the time the plants were put out, I left for Europe; when I returned my foreman called my special attention to this new tomato, which *had ripened its fruit several days earlier than any other kind of the twenty-five varieties I was growing scattered over my different farms.* On examining the new sort I saw at a glance that here was a decided acquisition. The fruit was not only the earliest of all, but of large size and exceedingly symmetrical and handsome, while in ripening it had no green left around the stem, a great fault with many kinds otherwise good. The fruit was heavy, full meated and rich, between round and oval in shape, and red in color; it was distributed very evenly on the vines. A correspondence developed the fact that the gentleman who sent it had for the past three seasons been testing it side by side with other standard varieties, and found that it ripened six to ten days earlier. This fact may be in part accounted for by its having been grown for years in a northern latitude, while the utmost care had always been used in the selecting of seed stock. As fair a test as I can present of its merits is this: a market gardener came over forty miles specially to examine my varieties of tomatoes on the ground as they grew, that he might select the very best for his own planting. After carefully examining every sort, *he emphatically declared his preference for this new kind*, though he knew nothing of its history." See advertisement.

The "Marblehead" Squash.

The above engraving is that of a new squash sent out for the first time this season, by Mr. J. J. H. Gregory. He has named it the "Marblehead," and says of it: "This new squash, as a rule, is characterized by a shell of more flinty hardness than the Hubbard. It is usually thicker and flatter at the top. It has a greater specific gravity. The flesh is of rather a lighter color than the Hubbard, while its combination of sweetness, dryness and delicious flavor is something really remarkable. In yield it equals the Hubbard, while its keeping properties are declared to surpass that famous variety. In the important matter of purity, it excels the Hubbard and every squash that I have ever raised. Its outer color is a light blue; not to be confounded with the blue colored squashes that come at times from the Hubbard seed—mongrels made by a cross of the Hubbard and a thin skinned squash which we used to call Middleton blue, which we were raising before we knew of the Hubbard, and raised for a few years after we had the Hubbard, side by side with it."

Marshall P. Wilder, Geo. B. Loring, and Paschall Morris, having tested this new squash, recommend it very highly. For further particulars, see advertisement.

Bee-Keepers' Call.

All bee-keepers in favor of a call and organization of a Bee-Keepers' Society in Corry, Pa., on the third Wednesday in April, will address the undersigned on receipt of this JOURNAL, and if enough respond I will make arrangements for a room and reduced hotel and railroad fare, and will report in April number of JOURNAL. E. L. WELLMAN,

February 20, 1873. Corry, Pa.